Corporation for
NATIONAL & COMMUNITY SERVICE

IMPACT EVALUATION

APPENDICES

Minnesota Reading Corps

K-3 Program

MARCH 2014

List of Appendices

Appendix A.1: Logic Model for the Process and Impact Evaluation of MRC 1

Appendix A.2: Illustration of the Randomization Process 2

Appendix A.3: Findings from Sensitivity Analysis 3

Appendix A.4: School Names Corresponding to School Codes 4

Appendix A.5: Detailed Methodology 5

Appendix B.1: Fall-Winter Models and Effects Tables 13

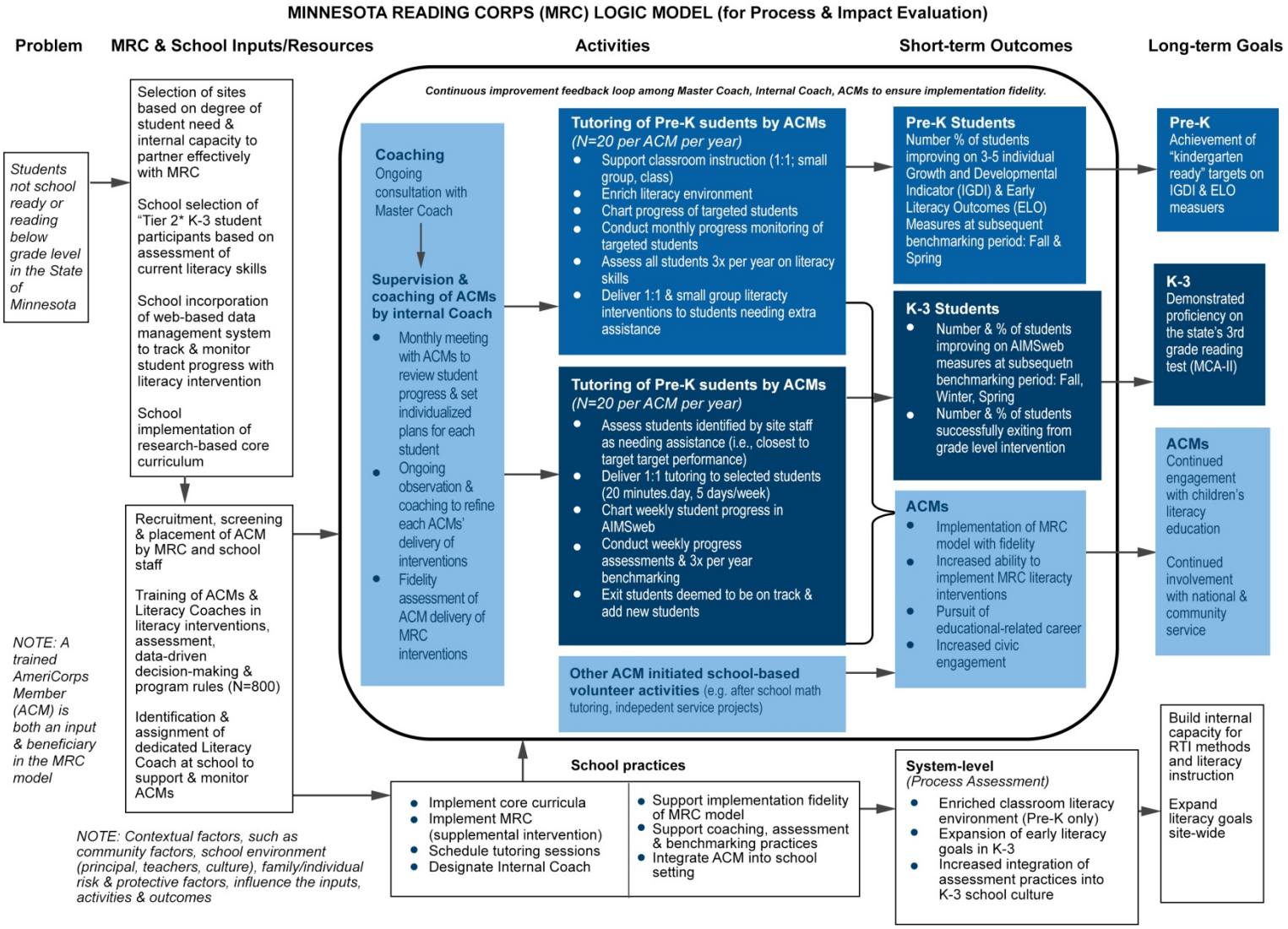
Appendix B.2: Findings from Robustness Analysis 81

Appendix C: IES What Works Clearinghouse Analysis 83

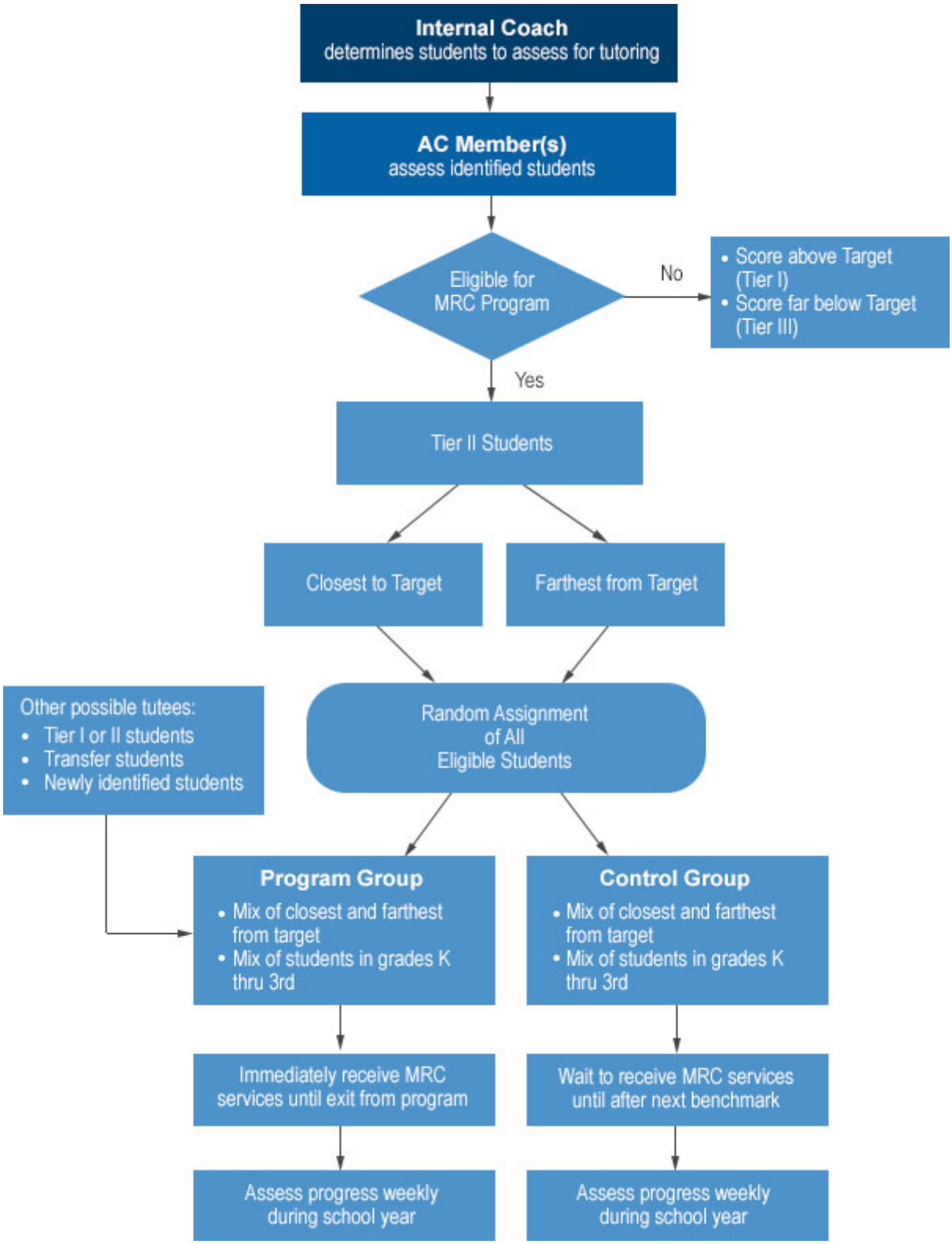
Appendix D: Full Year Models and Effects Tables 87

Appendix E: Glossary 97

Appendix A.1: Logic Model for the Process and Impact Evaluation of MRC



Appendix A.2: Illustration of the Randomization Process



Appendix A.3: Findings from Sensitivity Analysis

The sensitivity analysis was performed by first classifying each student in the original sample as either included (coded as 1) or excluded (coded as 0) from the final analysis. Students were excluded from the analysis due to withdrawal from a sampled school or due to a significant amount of missing data resulting from chronic school absence. A logistic regression was then performed predicting the likelihood of inclusion in the final analysis. The analysis indicates that Black, Hispanic, and Other Race students were less likely to be included in the final analysis sample. Also, students assigned to the program group were less likely to be included in the final analysis than students in the control group. Although some demographic characteristics were more likely to be associated with the excluded students, these results should be viewed in the context of the baseline analysis (presented in Table III.4. of the final report), which show that the baseline student demographics used in the final analysis were generally equivalent across program and control groups.

Table A.3.1. Logistic regression predicting inclusion in final analysis sample

Predictor	Effect	SE(Effect)	Sig.
Female	-0.051	(0.169)	
Dual Language Learner	0.225	(0.272)	
Black	-1.410	(0.227)	***
Asian	-0.187	(0.361)	
Hispanic	-1.405	(0.347)	***
Other race	-2.383	(0.400)	***
Assigned program	-0.992	(0.183)	***
Intercept	3.932	(0.309)	***

* $p < 0.05$

** $p < 0.01$

*** $p < 0.001$

Sample includes 1,527 students

Appendix A.4: School Names Corresponding to School Codes

Table A.4.1: School Names Corresponding to School Codes in Table III.5

Code	School Name
A	Becker Primary
B	Kapoisa
C	Jackson Preparatory Magnet
D	Forest Hills
E	Northrup Urban Environmental Learning Center
F	Pine City Elementary
G	Sheridan Arts Magnet
H	Bryn Mawr Elementary
I	Franklin Elementary
J	Frost Lake Magnet School of Technology & Global Studies
K	Green Central Park Elementary
L	Jefferson Elementary
M	Jenny Lind
N	Paul and Sheila Wellstone Elementary
O	Phalen Lake Hmong Studies Magnet
P	Riverside Central
Q	Bel Air Elementary
R	Nellie Stone Johnson
S	Oakdale Elementary
T	Sunset Terrace Elementary

Appendix A.5: Detailed Methodology

As explained in section III.B of the report, three sets of analyses were conducted to answer the study's research questions:

1. What is the impact of the MRC program on student literacy outcomes?
   a. Does the impact vary by student characteristics/demographics?
   b. Do assessment scores vary by AmeriCorps member characteristics/demographics?
2. Does the impact of the program vary week to week? Does the number of weeks of intervention (i.e., dosage) impact student literacy outcomes?
3. Does participation in MRC have a longer-term impact on student literacy outcomes as measured at the end of the school year?

The first set of analyses focus on the Fall-Winter Experimental Study data collected during the first semester of the 2012-2013 school year and was used to answer the first research question (RQ1), which assesses the impact of the MRC program on student literacy outcomes. The Fall-Winter experimental analyses employed growth models utilizing weekly progress monitoring data as primary outcomes and the Fall benchmarks as covariates to assess the impact of the MRC program on student literacy proficiency at each grade level.

Because it was not possible to continue the experimental RCT throughout the entire school year, all students who were eligible at the Winter benchmark to participate in the MRC program were allowed to receive services during the second semester of the 2012-2013 school year. Data from the first and second semester were combined to answer the second and third research questions aimed at assessing the week to week impact of the program on student literacy outcomes (RQ2), as well as the longer-term impact of the program on student literacy outcomes (RQ3).

Analysis 1: Fall-Winter Experimental Analyses

Impact Analysis

The overall goal of the Fall-Winter Experimental Study was to obtain a measure of an average treatment effect of the MRC program by grade. In a simple experiment, this measure of impact would be a straightforward comparison of program (treatment) and control group means at the end of the experimental period. However, because the evaluation team was able to obtain weekly assessment data on all students in the study, we were able to estimate the impact of the program on participants as a varying quantity over the weeks of the experimental period (Fall-Winter). This approach required that we estimate the effect of the MRC program on a weekly basis concurrent with typical growth trajectories. Therefore, our experimental analysis consisted of two phases for each grade. In the first

phase, a statistical model was developed to produce a set of regression coefficients that summarized the observed data. In the second phase, we then used the estimated model to predict marginal (average) scores for program participants and control group students at several weekly points. From these points, the evaluation team estimated the difference between program and control group students to measure program impacts. We then calculated the precision of our estimates for statistical tests.

The modeling of the MRC data presented several challenges. First, as weekly assessments were measured during a non-linear developmental period, treatment effects had to be measured as offsets to typical growth patterns. This was accomplished by employing a difference-in-difference technique, whereby program participation moderated the estimated growth trajectory of students. Since growth tends to be non-linear during early childhood years, growth trajectories in kindergarten were also smoothed using quadratic time variables.

Second, the distribution of the assessment metrics, especially in Kindergarten, tended to be highly skewed across the weeks of data, and so statistical models that assumed normality required log-transformed outcomes. Thus, we transformed all outcomes and benchmarks by taking the log of the score plus 1 (i.e., y*=ln(y+1)). Once the model was estimated, predicted scores, "xb," were transformed back into the original metric with exp(xb)-1.

Third, the analysis was further complicated by the nested nature of the data. Each observation is a weekly assessment nested within a student, who is in turn nested within a pair, which in turn is nested within a school. Thus, typical regression techniques would produce standard errors that may lead to false statements about effects. We instead employed mixed models or Hierarchical Linear Modeling (HLM) that estimated several random effects to produce the appropriate standard errors. Finally, since these data were weekly measurements, there was likely to be temporal autocorrelation across each student's residuals. In other words, the score at week 2 was likely to be highly correlated with the score at week 1. Thus, our models employed autoregressive residuals to adjust the standard errors for this temporal correlation.

Our final mixed models encompass all these features. In the model for each grade, the assessment from week *w* of student *i* in pair *j* in school *k* is a function of a set of effects for the trajectory, $\sum_{q=1}^{l} \pi_{qijk} w^q$, with autoregressive residuals. The intercept is then a function of the benchmark scores, *b*, an indicator of alternative treatments, *a*, and program participation, *p*. The intercept equation also includes random effects for the student, *e*, pair, *u*, and school, *v*. Finally, each of the *q* trajectory polynomials is modeled as a function of program participation, $\beta_{q0} + \beta_{q1} p_{ijk}$. Note that the outcome and benchmarks are transformed into a logged metric.

Thus, our final mixed model was

$$\ln\left[y_{wijk}+1\right]=\pi_{0ijk}+\sum_{q=1}^{l}\pi_{qijk}w^{q}+\rho r_{wijk}$$

where

$$\pi_{0ijk}=\beta_{00\,jk}+\beta_{01\,jk}\ln\left[b_{ijk}+1\right]+\beta_{02\,jk}a_{ijk}+\beta_{03\,jk}p_{ijk}+e_{ijk}+u_{jk}+v_{k}$$

and

$$\pi_{qijk}=\beta_{q0}+\beta_{q1}p_{ijk}$$

We then estimated this model for each grade. Note that for grades 1, 2, and 3 that *l* = 1, but for kindergarten *l* = 2. To maintain generalizability, we employed school-level sampling weights in our estimation. The key parameters in these models are represented as β_{q1}, which is the difference-in-difference effect. The estimated models are presented in Appendix B.1.

The second phase of the impact analysis was to predict scores for program and control groups by week, and test the weekly differences statistically. Specifically, we estimated the outcomes (in the original score metric) for program and control students assuming average benchmarks and no alternative treatments

$$\hat{y}_{w}=\begin{cases}\exp\left[\beta_{00}+\beta_{01}\overline{\ln[b+1]}+\sum_{q=1}^{l}\left(\beta_{q0}\right)w^{q}\right]-1 & \text{for control students}\\ \exp\left[\beta_{00}+\beta_{01}\overline{\ln[b+1]}+\beta_{03}+\sum_{q=1}^{l}\left(\beta_{q0}+\beta_{q1}\right)w^{q}\right]-1 & \text{for program participants}\end{cases}$$

What is revealing in the above expression is that the only differences between the control and program predictions are the terms β_{03} (which is the initial difference between program and control students) and β_{q1} (the difference-in-difference effects). Each point estimate had an estimated variance (i.e., sampling error) that was used to test whether the difference was 0. The variance of the estimates employed information about the model variance, so the statistical tests contrasting control and program estimates employed information about the precision of the model.

Two types of subgroup analysis were employed by the evaluation team. First, performed an omnibus Chi-square test of the γ effects (the subgroup effects on the difference-in-difference coefficients) to determine whether subgroup membership impacted the program effects on student trajectory. If an impact was determined, the evaluation team employed the second phase of the subgroup analyses, in which we again produced predicted values and tested the

differences between program and control students. For these analyses, we included a set of subgroup indicators, *S*, that moderated the trajectory effects and the impact of program participation on the trajectory effects, $p_{ijk}\sum_{s}\gamma_{qsjk}S_{ijk}$.

$$\ln\left[y_{wijk}+1\right]=\pi_{0ijk}+\sum_{q=1}^{l}\pi_{qijk}w^{q}+\rho r_{wijk}$$

where

$$\pi_{0ijk}=\beta_{00jk}+\beta_{01jk}\ln\left[b_{ijk}+1\right]+\beta_{02jk}a_{ijk}+\beta_{03jk}p_{ijk}+\sum_{s}\beta_{0sjk}S_{ijk}+e_{ijk}+u_{jk}+v_{k}$$

and

$$\pi_{qijk}=\beta_{q0}+\beta_{q1}p_{ijk}+\sum_{s}\beta_{qsjk}S_{ijk}+p_{ijk}\sum_{s}\gamma_{qsjk}S_{ijk}$$

Member- and School-Level Random Effects on Impacts

In order to determine whether members or schools were influential on gains for those assigned treatment, a intraclass correlation (ICC or ρ) analysis was conducted. Intraclass correlations measure the portion of the total variation in an outcome that is associated with various levels of analysis. In this case, the member ICC, ρ_{member}, measure the degree to which different students assigned the same member correlate on changes or gains in their assessment scores within a school. The school-level ICC, ρ_{school}, measures the degree to which students, who are located within the same school, but assigned to different members, correlate with one another.

We estimate these parameters using a mixed model where the difference between the winter and fall benchmark score for the *ith* child assigned member *j* in school *k* is a function of an overall mean difference,α, a member random effect,ϕ_{jk}, a school random effect,ζ_k, and a within-member student random effect,ϵ_{ijk}.

$$y_{ijk}^{(2)}-y_{ijk}^{(1)}=\alpha+\phi_{jk}+\zeta_k+\epsilon_{ijk}$$

We then estimate the variances components $\sigma^2_{member}=var(\phi_{jk})$ $\sigma^2_{school}=var(\zeta_k)$, and $\sigma^2_{student}=var(\epsilon_{ijk})$, and calculate two ICCs

The ICC for members is

$$\rho_{member}=\frac{\sigma^2_{member}}{\sigma^2_{member}+\sigma^2_{school}+\sigma^2_{student}}$$

and for the school it is

$$\rho_{school} = \frac{\sigma^2_{school}}{\sigma^2_{member} + \sigma^2_{school} + \sigma^2_{student}}.$$

A key component in evaluating ICCs is to measure the uncertainty associated with them. Recent work by Hedges, et al (2012) has provided a formula for the estimate of the variance of ICCs based on the estimated precision of the derived variance components.[1]

AmeriCorps Member Fixed Effects on Assessment Scores

To assess the impact of member fixed characteristics (i.e. observed demographics) on treatment students' assessment scores, the evaluation team estimated another statistical model on a set of data where the assessments were standardized within grade and combined into a single model. In other words, we estimated standardized assessment scores within each grade, combined the data, and fit a model predicting scores with member characteristics (age, education years, specialized degree, full time status, tenure status, race/ethnicity, and gender), a simple time trend, student gender, and the interaction between member and student gender. Since the outcomes are standardized, the effect is estimated from the change in standard deviations. Note that while we fit a multilevel model, the variance components for members are confounded with the variance attributed to grades and schools because members were assigned specific grades and schools. This required an additional set of models to test whether member random effects were substantial enough that they should be included in the final model. To answer whether members had unique random effects on student outcomes, we fit grade-specific unconditional models (i.e., no controls) and calculated the correlation of outcomes from students tutored by the same member. We found little variance attributed to random member effects and, since the resulting ICCs were small, member effects were not accounted for in the final model.

Analysis 2: Full Year Non-Experimental Analysis

For the second set of analyses, data from the first and second semester were combined to answer the second research question, which focused on better understanding patterns of week over week growth in reading proficiency by grade. After the first semester, all students who were eligible at the Winter benchmark to participate in the MRC program were allowed to receive services (program and control group members). Therefore, while the evaluation team employed similar analytic coding strategies and estimation techniques as applied in the first analysis, the second analysis differed in that we acknowledged that variation in dosage existed over the course of the year.

[1] Hedges, Larry V., Hedberg, E. C., and Kuyper, Arend M. 2012. *The Variance of Intraclass Correlations in Three- and Four-Level Models*. Educational and Psychological Measurement.

Therefore, our primary predictor was not program participation as a moderator of trajectory, but instead the number of cumulative weeks of receiving the program.

The cumulative number of weeks of receiving the program was coded in such a way that for any given week, the value was the number of sessions each student received up to and including that week. For example, if a student never received sessions, their weekly value was always 0. If a student received sessions each week for the whole year, they were coded as 1 for the first week, 2 for the second week, etc. Also, when a student stopped receiving sessions, the final weeks of the year were coded the same as their final week of sessions. For example, if a student stopped receiving sessions at week 5, they were coded as 5 for the remaining weeks. This allowed individual student variation in the pattern of sessions, while fitting a model that estimated the effect of receiving an additional week of sessions.

Similar to our Fall-Winter experimental analysis, we again fit a multilevel model; however, we removed the random effect for pairs since other pair members were allowed the program after the first semester. In this model, we coded each week with the dichotomous variable for receiving the program, *r*, and used the cumulative sum of this variable as a predictor. As with our Fall-Winter experimental analysis, we again use polynomials to capture non-linearity in kindergarten. We also controlled for the semester, *d*, and original program assignment,*p*. The final statistical model is

$$\ln(y_{wik} + 1) = \pi_{0ik} + \pi_{1ik} d_w + \sum_{q=1}^{l} \zeta_{qik} w^q + \sum_{c=1}^{l} \kappa_{cik} \left(\sum_{g=1}^{w} t_{wik} \right)^c + \rho r_{wik}$$

where

$$pi_{0ik} = \beta_{00k} + \beta_{01k} p_{ik} + e_{ik} + v_k$$

where $\sum_{g=1}^{w} t_{wik}$ is the number of cumulative sessions for that week.

To summarize the results of this model, we estimated the tangential change in the outcome

$$\frac{\partial y_{wik}}{\partial \sum_{g=1}^{w} t_{wik}}$$

when moving from 0 to 1 weeks of sessions, 1 to 2 weeks of sessions, and so on. We caution that these effects are not necessarily causal, since receiving treatment is a function of performance on benchmark. To explain, if a student exceeds benchmarks in the Fall they qualify to exit the MRC program and stop receiving treatment. If, however, their performance is relatively close, but still below benchmark in the Winter they could re-enter the program. Thus,

negative associations between the number of sessions and student outcomes are likely due to assigning the program to struggling students rather than the program having causally detrimental effects.

Analysis 3: Exploratory Analysis

Analysis of Probabilities of Group Membership

The ultimate goal of the program is to matriculate students into an "above benchmark" status. Therefore, our final analysis examines this question by asking which trajectory pattern are program participants most likely to follow. We conceived of two plausible methods to measure this. First, we consider nominal categories of trajectory patterns and estimate the likelihood of a student falling into one of these nominal categories based on the experimental assignment. Our second approach views trajectory as a more linear concept that is altered during and after exposure to the program.

In the first approach, we coded each student as belonging to the following categories:

- No program effect (always below benchmark)
- Temporary program effect (moving above and below benchmark and ending the school year below)
- Final program effect (starting below benchmark, then eventually progressing and remaining above benchmark for the remainder of the school year)
- Always above benchmark
- Negative effect (above, then ending below benchmark)

Of these five patterns, the latter two represented a very small portion of students (4) and were not included in the final analysis. We performed a multinomial logistic regression analysis predicting the likelihood of students falling into each of the three major classes or groups as a function of program assignment, cumulative sessions, and demographics. We also included an interaction term between program assignment and cumulative sessions, again because some students that where initially assigned to the control group received sessions in the second semester.

Once we estimated the model (provided in Appendix D), the evaluation team then predicted the likelihood of following each group pattern for two average students who received the same dosage of the program, specifically 10 tutoring sessions, with the only difference being that one student was originally assigned to the program group and the other to the control group. The key comparison is the likelihood of falling into the "final program effect" category for those students assigned to the program group versus the control group. Because all other differences between the two theoretical students were held constant in the model, including program dosage (i.e., 10 sessions of tutoring), the only difference is the timing in which the students would have received MRC tutoring (i.e., first vs. second semester).

Therefore, the findings from this analysis indicate whether early intervention of the program results in a higher or lower likelihood of falling into the "final program effect" group.

Spline Analysis

Spline models are typical in analyses that seek to fit a model to data measured over time, where specific events are hypothesized to change the trajectory. In our case, the spline models measure not only the growth of students over the course of the year, but specifically how those growth patterns are altered by participation in the program. The spline model allows for a linear trajectory across the entire school year, and also allows for this trajectory to be adjusted based on two phases: during treatment, D_1, and after treatment, D_2. Thus, the spline model we fit to the data is

$$y_{it} = \beta_0 + \beta_1 Week_{it} + \sum_j (D_{jit} \times Week_{it}) + e_{it}$$

The purpose of the analysis was to examine changes to the trajectory of student achievement prior to, during, and after receiving MRC tutoring, regardless of initial assignment to conditions (program or control group). We fit the model on a subset of cases in each grade that received at least one weekly session of tutoring during the school year. We also limited the analysis to only 10 weekly tutoring sessions to remove the cross-semester (i.e., first vs. second semester) effects of low performing students who would have required a larger dosage of the MRC intervention.

Appendix B.1: Fall-Winter Models and Effects Tables

Table B.1.1. Model predicting Fall Kindergarten students' weekly assessments[a]

	Effect	SE(Effect)	Sig.
Fixed Effects			
Benchmark	0.635	(0.020)	***
Alternative treatment	0.420	(0.096)	***
Program	-0.306	(0.096)	***
Time[b]	0.180	(0.055)	***
Program × time	0.180	(0.009)	***
Time squared	-0.002	(0.012)	***
Program × time squared	-0.008	(0.000)	***
Intercept	-0.096	(0.001)	
Observations			
Weeks	4474		
Students	359		
Pairs	193		
Schools	17		

Notes: a: outcome is natural log of assessment score + 1; b: weeks since 9-1-2012

* p <0.05

** p < 0.01

*** p < 0.001

Kindergarten sample includes 359 students.

Table B.1.2. Model predicting Fall first grade students' weekly assessments[a]

	Effect	SE(Effect)	Sig.
Fixed Effects			
Benchmark	0.482	(0.011)	***
Alternative treatment	-0.053	(0.020)	**
Program	-0.024	(0.014)	
Time[b]	0.058	(0.001)	***
Program × time	0.008	(0.001)	***
Intercept	1.649	(0.038)	***
Observations			
Weeks	5078		
Students	409		
Pairs	215		
Schools	21		

Notes: a: outcome is natural log of assessment score + 1; b: weeks since 9-1-2012

* p <0.05

** p < 0.01

*** p < 0.001

First grade sample includes 409 students.

Table B.1.3 Model predicting Fall second grade students' weekly assessments[a]

	Effect	SE(Effect)	Sig.
Fixed Effects			
Benchmark	0.693	(0.017)	***
Alternative treatment	-0.057	(0.026)	*
Program	-0.044	(0.018)	*
Time[b]	0.033	(0.001)	***
Program × time	0.005	(0.001)	***
Intercept	1.102	(0.059)	***
Observations			
Weeks	3234		
Students	265		
Pairs	143		
Schools	20		

Notes: a: outcome is natural log of assessment score + 1; b: weeks since 9-1-2012

* p <0.05

** p < 0.01

*** p < 0.001

Second grade sample includes 265 students.

Table B.1.4. Model predicting Fall third grade students' weekly assessments[a]

	Effect	SE(Effect)	Sig.
Fixed Effects			
Benchmark	0.765	(0.011)	***
Alternative treatment	-0.028	(0.014)	
Program	-0.047	(0.009)	***
Time[b]	0.026	(0.001)	***
Program × time	0.004	(0.001)	***
Intercept	0.983	(0.045)	***
Observations			
Weeks	3214		
Students	268		
Pairs	156		
Schools	20		

Notes: a: outcome is natural log of assessment score + 1; b: weeks since 9-1-2012

* p <0.05

** p < 0.01

*** p < 0.001

Third grade sample includes 308 students.

Table B.1.5. Estimated scores for all Kindergarten program and control group students

Kindergarten (N=359)		Estimated Score	SE	Sig.	Confidence Interval	
Week 1	Control	1.931	(0.150)	***	1.636	2.226
	Program	1.484	(0.126)	***	1.237	1.730
	Difference	-0.447	(0.127)	***	-0.696	-0.199
Week 4	Control	3.855	(0.222)	***	3.420	4.289
	Program	5.281	(0.284)	***	4.724	5.838
	Difference	1.426	(0.191)	***	1.052	1.800
Week 7	Control	6.720	(0.351)	***	6.032	7.408
	Program	12.238	(0.596)	***	11.070	13.407
	Difference	5.518	(0.406)	***	4.723	6.314
Week 10	Control	10.787	(0.538)	***	9.734	11.841
	Program	22.255	(1.050)	***	20.198	24.312
	Difference	11.468	(0.741)	***	10.017	12.919
Week 13	Control	16.279	(0.783)	***	14.745	17.812
	Program	33.045	(1.526)	***	30.054	36.037
	Difference	16.767	(1.065)	***	14.679	18.855
Week 16	Control	23.318	(1.175)	***	21.016	25.621
	Program	40.540	(1.978)	***	36.663	44.416
	Difference	17.221	(1.480)	***	14.320	20.122

Table B.1.6. Estimated scores for all first grade program participants and control students

First Grade (N=409)		Estimated Score	SE	Sig.	Confidence Interval	
Week 1	Control	24.100	(0.272)	***	23.566	24.634
	Program	23.581	(0.259)	***	23.074	24.089
	Difference	-0.518	(0.328)		-1.160	0.124
Week 4	Control	28.862	(0.274)	***	28.324	29.399
	Program	28.981	(0.270)	***	28.452	29.509
	Difference	0.119	(0.315)		-0.498	0.736
Week 7	Control	34.527	(0.289)	***	33.960	35.094
	Program	35.566	(0.295)	***	34.988	36.143
	Difference	1.039	(0.316)	**	0.420	1.658
Week 10	Control	41.267	(0.336)	***	40.609	41.926
	Program	43.597	(0.353)	***	42.905	44.290
	Difference	2.330	(0.368)	***	1.608	3.052
Week 13	Control	49.286	(0.436)	***	48.432	50.141
	Program	53.393	(0.470)	***	52.472	54.313
	Difference	4.106	(0.513)	***	3.101	5.112
Week 16	Control	58.827	(0.605)	***	57.640	60.013
	Program	65.340	(0.664)	***	64.037	66.642
	Difference	6.513	(0.771)	***	5.002	8.024

Table B.1.7. Estimated scores for all second grade program participants and control students

Second Grade (N=265)		Estimated Score	SE	Sig.	Confidence Interval	
Week 1	Control	29.951	(0.457)	***	29.055	30.847
	Program	28.280	(0.435)	***	27.428	29.132
	Difference	-1.671	(0.487)	***	-2.625	-0.716
Week 4	Control	33.170	(0.464)	***	32.260	34.079
	Program	31.856	(0.451)	***	30.971	32.741
	Difference	-1.314	(0.469)	**	-2.233	-0.395
Week 7	Control	36.723	(0.485)	***	35.772	37.674
	Program	35.868	(0.482)	***	34.923	36.814
	Difference	-0.855	(0.471)		-1.778	0.068
Week 10	Control	40.646	(0.529)	***	39.608	41.684
	Program	40.371	(0.536)	***	39.320	41.421
	Difference	-0.275	(0.512)		-1.279	0.728
Week 13	Control	44.977	(0.604)	***	43.793	46.162
	Program	45.423	(0.620)	***	44.207	46.639
	Difference	0.446	(0.610)		-0.750	1.641
Week 16	Control	49.759	(0.716)	***	48.356	51.162
	Program	51.092	(0.743)	***	49.636	52.549
	Difference	1.334	(0.772)		-0.180	2.847

Table B.1.8. Estimated scores for all third grade program participants and control students

Third Grade (N=308)		Estimated Score	SE	Sig.	Confidence Interval	
Week 1	Control	55.594	(0.406)	***	54.798	56.390
	Program	53.598	(0.368)	***	52.877	54.319
	Difference	-1.996	(0.475)	***	-2.927	-1.066
Week 4	Control	60.236	(0.384)	***	59.483	60.989
	Program	58.794	(0.356)	***	58.096	59.492
	Difference	-1.442	(0.431)	***	-2.287	-0.598
Week 7	Control	65.259	(0.378)	***	64.517	66.001
	Program	64.485	(0.358)	***	63.783	65.186
	Difference	-0.774	(0.408)		-1.573	0.025
Week 10	Control	70.693	(0.401)	***	69.908	71.479
	Program	70.717	(0.384)	***	69.964	71.470
	Difference	0.024	(0.429)		-0.816	0.864
Week 13	Control	76.574	(0.460)	***	75.672	77.476
	Program	77.543	(0.444)	***	76.672	78.413
	Difference	0.969	(0.511)		-0.033	1.971
Week 16	Control	82.936	(0.560)	***	81.839	84.034
	Program	85.018	(0.541)	***	83.956	86.079
	Difference	2.081	(0.657)	**	0.793	3.369

Table B.1.9. Model predicting gender-moderated Fall Kindergarten student weekly assessments[a]

	Effect	SE(Effect)	Sig.
Fixed Effects			
Benchmark	0.636	(0.020)	***
Alternative treatment	0.424	(0.096)	***
Female	-0.066	(0.079)	
Program	-0.421	(0.081)	***
Time[b]	0.171	(0.013)	***
Program × time	0.207	(0.018)	***
Time squared	-0.002	(0.001)	**
Program × time squared	-0.009	(0.001)	***
Female × program	0.221	(0.110)	*
Female × time	0.017	(0.017)	
Female × program × time	-0.051	(0.024)	*
Female × time squared	0.000	(0.001)	
Female × program × time squared	0.002	(0.001)	
Intercept	-0.061	(0.076)	
Observations			
Weeks	4474		
Students	359		
Pairs	193		
Schools	17		

Notes: a: outcome is natural log of assessment score + 1; b: weeks since 9-1-2012
* p <0.05
** p < 0.01
*** p < 0.001
Kindergarten sample includes 159 male and 200 female students

Table B.1.10. Model predicting gender-moderated Fall first grade students' weekly assessments[a]

	Effect	SE(Effect)	Sig.
Fixed Effects			
Benchmark	0.482	(0.011)	***
Alternative treatment	-0.053	(0.020)	**
Female	0.024	(0.021)	
Program	-0.038	(0.021)	
Time[b]	0.060	(0.001)	***
Program × time	0.010	(0.002)	***
Female × program	0.031	(0.029)	
Female × time	-0.003	(0.002)	
Female × program × time	-0.003	(0.003)	
Intercept	1.636	(0.039)	***
Observations			
Weeks	5078		
Students	409		
Pairs	215		
Schools	21		

Notes: a: outcome is natural log of assessment score + 1; b: weeks since 9-1-2012
* p <0.05
** p < 0.01
*** p < 0.001
First grade sample includes 195 male and 214 female students

Table B.1.11. Model predicting gender-moderated Fall third grade students' weekly assessments[a]

	Effect	SE(Effect)	Sig.
Fixed Effects			
Benchmark	0.692	(0.017)	***
Alternative treatment	-0.049	(0.026)	
Female	0.026	(0.025)	
Program	-0.052	(0.024)	*
Time[b]	0.032	(0.001)	***
Program × time	0.010	(0.002)	***
Female × program	0.032	(0.036)	
Female × time	0.001	(0.002)	
Female × program × time	-0.012	(0.003)	***
Intercept	1.089	(0.060)	***
Observations			
Weeks	3631		
Students	308		
Pairs	168		
Schools	21		

Notes: a: outcome is natural log of assessment score + 1; b: weeks since 9-1-2012
* p <0.05
** p < 0.01
*** p < 0.001
Third grade sample includes 165 male and 143 female students

Table B.1.12. Estimated scores for Kindergarten Male program participants and control students

Kindergarten (N=159)		Estimated Score	SE	Sig.	Confidence Interval	
Week 1	Control	2.012	(0.191)	***	1.636	2.387
	Program	1.333	(0.141)	***	1.057	1.610
	Difference	-0.678	(0.187)	***	-1.045	-0.312
Week 4	Control	3.861	(0.257)	***	3.357	4.366
	Program	5.158	(0.315)	***	4.540	5.775
	Difference	1.296	(0.271)	***	0.766	1.827
Week 7	Control	6.546	(0.396)	***	5.770	7.322
	Program	12.369	(0.679)	***	11.039	13.699
	Difference	5.823	(0.554)	***	4.737	6.909
Week 10	Control	10.263	(0.594)	***	9.100	11.427
	Program	22.875	(1.216)	***	20.491	25.259
	Difference	12.612	(1.002)	***	10.648	14.576
Week 13	Control	15.166	(0.842)	***	13.515	16.816
	Program	34.074	(1.766)	***	30.613	37.535
	Difference	18.908	(1.444)	***	16.079	21.738
Week 16	Control	21.310	(1.294)	***	18.774	23.847
	Program	41.384	(2.341)	***	36.797	45.971
	Difference	20.074	(2.060)	***	16.036	24.111

Table B.1.13. Estimated scores for Kindergarten Female program participants and control students

Kindergarten (N=200)		Estimated Score	SE	Sig.	Confidence Interval	
Week 1	Control	1.867	(0.169)	***	1.535	2.198
	Program	1.637	(0.156)	***	1.330	1.943
	Difference	-0.230	(0.173)		-0.569	0.109
Week 4	Control	3.850	(0.243)	***	3.373	4.326
	Program	5.406	(0.323)	***	4.774	6.038
	Difference	1.556	(0.260)	***	1.046	2.066
Week 7	Control	6.865	(0.392)	***	6.096	7.633
	Program	12.129	(0.656)	***	10.845	13.414
	Difference	5.265	(0.515)	***	4.255	6.274
Week 10	Control	11.226	(0.612)	***	10.025	12.426
	Program	21.701	(1.138)	***	19.472	23.931
	Difference	10.476	(0.902)	***	8.708	12.244
Week 13	Control	17.218	(0.904)	***	15.447	18.989
	Program	32.114	(1.644)	***	28.892	35.336
	Difference	14.896	(1.288)	***	12.371	17.421
Week 16	Control	25.023	(1.414)	***	22.251	27.795
	Program	39.749	(2.222)	***	35.393	44.105
	Difference	14.726	(1.917)	***	10.968	18.484

Table B.1.14. Estimated scores for first grade Male program participants and control students

First Grade (N=195)		Estimated Score	SE	Sig.	Confidence Interval	
Week 1	Control	23.830	(0.376)	***	23.094	24.567
	Program	23.022	(0.334)	***	22.368	23.676
	Difference	-0.809	(0.469)		-1.727	0.110
Week 4	Control	28.695	(0.373)	***	27.964	29.426
	Program	28.575	(0.344)	***	27.900	29.250
	Difference	-0.120	(0.457)		-1.016	0.777
Week 7	Control	34.512	(0.388)	***	33.752	35.273
	Program	35.412	(0.373)	***	34.681	36.142
	Difference	0.900	(0.467)		-0.016	1.816
Week 10	Control	41.469	(0.453)	***	40.581	42.357
	Program	43.829	(0.450)	***	42.946	44.711
	Difference	2.360	(0.551)	***	1.280	3.440
Week 13	Control	49.789	(0.603)	***	48.607	50.970
	Program	54.192	(0.614)	***	52.988	55.395
	Difference	4.403	(0.767)	***	2.900	5.906
Week 16	Control	59.738	(0.861)	***	58.050	61.426
	Program	66.950	(0.895)	***	65.197	68.704
	Difference	7.212	(1.148)	***	4.962	9.463

Table B.1.15. Estimated scores for first grade Female program participants and control students

First Grade (N=214)		Estimated Score	SE	Sig.	Confidence Interval	
Week 1	Control	24.344	(0.356)	***	23.646	25.042
	Program	24.205	(0.360)	***	23.499	24.911
	Difference	-0.139	(0.470)		-1.060	0.782
Week 4	Control	29.020	(0.350)	***	28.335	29.705
	Program	29.431	(0.363)	***	28.719	30.144
	Difference	0.411	(0.451)		-0.473	1.295
Week 7	Control	34.559	(0.358)	***	33.857	35.261
	Program	35.741	(0.385)	***	34.988	36.495
	Difference	1.183	(0.452)	**	0.298	2.068
Week 10	Control	41.120	(0.411)	***	40.314	41.925
	Program	43.360	(0.455)	***	42.468	44.252
	Difference	2.240	(0.523)	***	1.216	3.264
Week 13	Control	48.891	(0.539)	***	47.834	49.947
	Program	52.558	(0.610)	***	51.362	53.754
	Difference	3.667	(0.718)	***	2.259	5.075
Week 16	Control	58.096	(0.762)	***	56.603	59.588
	Program	63.663	(0.875)	***	61.949	65.378
	Difference	5.568	(1.066)	***	3.479	7.656

Table B.1.16. Estimated scores for third grade Male program participants and control students

Third Grade (N=165)		Estimated Score	SE	Sig.	Confidence Interval	
Week 1	Control	55.957	(0.549)	***	54.880	57.034
	Program	53.882	(0.448)	***	53.005	54.759
	Difference	-2.075	(0.658)	**	-3.364	-0.786
Week 4	Control	60.195	(0.506)	***	59.204	61.186
	Program	59.323	(0.428)	***	58.484	60.162
	Difference	-0.872	(0.598)		-2.044	0.299
Week 7	Control	64.749	(0.485)	***	63.798	65.700
	Program	65.303	(0.427)	***	64.467	66.140
	Difference	0.554	(0.567)		-0.557	1.665
Week 10	Control	69.642	(0.508)	***	68.647	70.637
	Program	71.877	(0.459)	***	70.978	72.776
	Difference	2.235	(0.595)	***	1.068	3.402
Week 13	Control	74.899	(0.587)	***	73.749	76.049
	Program	79.102	(0.537)	***	78.050	80.154
	Difference	4.203	(0.706)	***	2.819	5.587
Week 16	Control	80.547	(0.724)	***	79.128	81.967
	Program	87.044	(0.667)	***	85.737	88.350
	Difference	6.496	(0.901)	***	4.731	8.262

Table B.1.17. Estimated scores for third grade Female program participants and control students

Third Grade (N=143)		Estimated Score	SE	Sig.	Confidence Interval	
Week 1	Control	55.284	(0.534)	***	54.238	56.331
	Program	53.168	(0.544)	***	52.102	54.233
	Difference	-2.117	(0.718)	**	-3.523	-0.710
Week 4	Control	60.309	(0.500)	***	59.329	61.289
	Program	57.981	(0.510)	***	56.980	58.981
	Difference	-2.328	(0.658)	***	-3.618	-1.039
Week 7	Control	65.782	(0.488)	***	64.825	66.739
	Program	63.221	(0.499)	***	62.243	64.199
	Difference	-2.561	(0.629)	***	-3.794	-1.328
Week 10	Control	71.744	(0.518)	***	70.728	72.760
	Program	68.927	(0.529)	***	67.890	69.965
	Difference	-2.817	(0.664)	***	-4.118	-1.516
Week 13	Control	78.238	(0.606)	***	77.051	79.426
	Program	75.141	(0.617)	***	73.931	76.350
	Difference	-3.097	(0.787)	***	-4.640	-1.554
Week 16	Control	85.312	(0.755)	***	83.832	86.792
	Program	81.906	(0.766)	***	80.404	83.408
	Difference	-3.406	(1.003)	***	-5.372	-1.440

Table B.1.18. Model predicting race-moderated Fall Kindergarten student weekly assessments[a]

	Effect	SE(Effect)	Sig.
Fixed Effects			
Benchmark	0.641	(0.019)	***
Alternative treatment	0.480	(0.094)	***
Student is Black	0.064	(0.107)	
Student is Asian	-0.161	(0.104)	
Student is Hispanic	-0.162	(0.150)	
Student is Other	0.419	(0.203)	*
Program	-0.397	(0.095)	***
Time[b]	0.215	(0.016)	***
Program × time	0.163	(0.021)	***
Time squared	-0.005	(0.001)	***
Program × time squared	-0.007	(0.001)	***
Program ×			
Student is Black	0.286	(0.139)	*
Student is Asian	-0.018	(0.135)	
Student is Hispanic	0.457	(0.229)	*
Student is Other	-0.537	(0.301)	
Time ×			
Student is Black	-0.087	(0.023)	***
Student is Asian	-0.006	(0.022)	
Student is Hispanic	-0.048	(0.032)	
Student is Other	-0.132	(0.045)	**
Program × time ×			
Student is Black	-0.043	(0.030)	
Student is Asian	0.093	(0.030)	**
Student is Hispanic	-0.055	(0.050)	
Student is Other	0.174	(0.066)	**
Time squared ×			
Student is Black	0.004	(0.001)	***
Student is Asian	0.001	(0.001)	
Student is Hispanic	0.005	(0.002)	**
Student is Other	0.005	(0.002)	*
Program × time squared ×			
Student is Black	0.002	(0.002)	
Student is Asian	-0.004	(0.002)	*
Student is Hispanic	0.000	(0.003)	
Student is Other	-0.006	(0.004)	
Intercept	-0.075	(0.087)	
Observations			
Weeks	4474		
Students	359		
Pairs	193		
Schools	17		

Notes: a: outcome is natural log of assessment score + 1; b: weeks since 9-1-2012

* p <0.05

** p < 0.01

*** p < 0.001

Kindergarten sample includes 107 White, 119 Black, and 97 Asian students

Table B.1.19. Model predicting race-moderated Fall first grade students' weekly assessments[a]

	Effect	SE(Effect)	Sig.
Fixed Effects			
Benchmark	0.479	(0.012)	***
Alternative treatment	-0.045	(0.020)	*
Student is Black	-0.075	(0.029)	**
Student is Asian	-0.056	(0.028)	*
Student is Hispanic	-0.088	(0.033)	**
Student is Other	0.015	(0.122)	
Program	-0.037	(0.022)	
Time[b]	0.058	(0.001)	***
Program × time	0.005	(0.002)	*
Program ×			
Student is Black	-0.025	(0.040)	
Student is Asian	0.035	(0.034)	
Student is Hispanic	0.035	(0.052)	
Student is Other	-0.026	(0.175)	
Time ×			
Student is Black	0.002	(0.002)	
Student is Asian	0.001	(0.002)	
Student is Hispanic	-0.005	(0.003)	
Student is Other	-0.016	(0.011)	
Program × time ×			
Student is Black	0.010	(0.004)	**
Student is Asian	0.003	(0.003)	
Student is Hispanic	0.008	(0.005)	
Student is Other	-0.002	(0.015)	
Intercept	1.700	(0.041)	***
Observations			
Weeks	5078		
Students	409		
Pairs	215		
Schools	21		

Notes: a: outcome is natural log of assessment score + 1; b: weeks since 9-1-2012

* p <0.05

** p < 0.01

*** p < 0.001

First grade sample includes 161 White, 88 Black, and 108 Asian students

Table B.1.20. Model predicting race-moderated Fall third grade students' weekly assessments[a]

	Effect	SE(Effect)	Sig.
Fixed Effects			
Benchmark	0.745	(0.011)	***
Alternative treatment	-0.038	(0.015)	*
Student is Black	-0.052	(0.020)	**
Student is Asian	-0.105	(0.016)	***
Student is Hispanic	-0.068	(0.027)	*
Student is Other	-0.018	(0.070)	
Program	-0.057	(0.014)	***
Time[b]	0.025	(0.001)	***
Program × time	0.005	(0.001)	***
Program ×			
Student is Black	-0.010	(0.026)	
Student is Asian	0.032	(0.021)	
Student is Hispanic	0.074	(0.038)	
Student is Other	-0.138	(0.077)	
Time ×			
Student is Black	0.000	(0.002)	
Student is Asian	0.003	(0.001)	*
Student is Hispanic	-0.001	(0.002)	
Student is Other	-0.004	(0.006)	
Program × time ×			
Student is Black	0.000	(0.002)	
Student is Asian	-0.004	(0.002)	*
Student is Hispanic	-0.007	(0.003)	*
Student is Other	0.014	(0.006)	*
Intercept	1.110	(0.045)	***
Observations			
Weeks	3617		
Students	305		
Pairs	167		
Schools	21		

Notes: a: outcome is natural log of assessment score + 1; b: weeks since 9-1-2012

* p <0.05

** p < 0.01

*** p < 0.001

Third grade sample includes 121 White, 71 Black, and 81 Asian students

Table B.1.21. Estimated scores for Kindergarten White program participants and control students

Kindergarten (N=107)		Estimated Score	SE	Sig.	Confidence Interval	
Week 1	Control	2.144	(0.229)	***	1.695	2.593
	Program	1.382	(0.154)	***	1.080	1.683
	Difference	-0.762	(0.232)	**	-1.217	-0.308
Week 4	Control	4.602	(0.332)	***	3.951	5.253
	Program	5.225	(0.329)	***	4.581	5.870
	Difference	0.623	(0.337)		-0.038	1.285
Week 7	Control	8.201	(0.540)	***	7.142	9.260
	Program	12.210	(0.690)	***	10.858	13.563
	Difference	4.010	(0.635)	***	2.765	5.255
Week 10	Control	12.928	(0.822)	***	11.318	14.539
	Program	21.757	(1.196)	***	19.414	24.101
	Difference	8.829	(1.074)	***	6.724	10.934
Week 13	Control	18.435	(1.131)	***	16.219	20.651
	Program	30.826	(1.650)	***	27.592	34.059
	Difference	12.391	(1.463)	***	9.523	15.259
Week 16	Control	23.996	(1.646)	***	20.770	27.222
	Program	35.131	(2.085)	***	31.045	39.218
	Difference	11.135	(2.085)	***	7.050	15.221

Table B.1.22. Estimated scores for Kindergarten Black program participants and control students

Kindergarten (N=119)		Estimated Score	SE	Sig.	Confidence Interval	
Week 1	Control	2.086	(0.234)	***	1.627	2.546
	Program	1.987	(0.213)	***	1.568	2.405
	Difference	-0.100	(0.260)		-0.610	0.410
Week 4	Control	3.520	(0.278)	***	2.976	4.064
	Program	4.822	(0.346)	***	4.144	5.500
	Difference	1.302	(0.321)	***	0.673	1.931
Week 7	Control	5.593	(0.398)	***	4.812	6.373
	Program	9.353	(0.607)	***	8.163	10.543
	Difference	3.760	(0.533)	***	2.716	4.804
Week 10	Control	8.574	(0.580)	***	7.437	9.711
	Program	15.794	(0.986)	***	13.861	17.726
	Difference	7.220	(0.857)	***	5.540	8.899
Week 13	Control	12.845	(0.829)	***	11.220	14.470
	Program	23.850	(1.444)	***	21.021	26.680
	Difference	11.005	(1.241)	***	8.574	13.437
Week 16	Control	18.936	(1.355)	***	16.280	21.593
	Program	32.545	(2.183)	***	28.267	36.823
	Difference	13.609	(2.051)	***	9.588	17.629

Table B.1.23. Estimated scores for Kindergarten Asian program participants and control students

Kindergarten (N=97)		Estimated Score	SE	Sig.	Confidence Interval	
Week 1	Control	1.665	(0.190)	***	1.292	2.038
	Program	1.168	(0.161)	***	0.852	1.485
	Difference	-0.496	(0.196)	*	-0.881	-0.112
Week 4	Control	3.759	(0.283)	***	3.204	4.313
	Program	6.097	(0.439)	***	5.236	6.957
	Difference	2.338	(0.366)	***	1.620	3.056
Week 7	Control	7.020	(0.474)	***	6.091	7.950
	Program	17.047	(1.110)	***	14.872	19.221
	Difference	10.026	(0.928)	***	8.207	11.845
Week 10	Control	11.758	(0.760)	***	10.268	13.248
	Program	34.659	(2.204)	***	30.339	38.979
	Difference	22.901	(1.889)	***	19.200	26.602
Week 13	Control	18.155	(1.127)	***	15.945	20.364
	Program	53.750	(3.347)	***	47.190	60.310
	Difference	35.595	(2.859)	***	29.993	41.198
Week 16	Control	26.142	(1.765)	***	22.683	29.601
	Program	64.317	(4.460)	***	55.575	73.059
	Difference	38.175	(3.970)	***	30.395	45.956

Table B.1.24. Estimated scores for first grade White program participants and control students

First Grade (N=161)		Estimated Score	SE	Sig.	Confidence Interval	
Week 1	Control	25.185	(0.439)	***	24.325	26.045
	Program	24.204	(0.387)	***	23.445	24.963
	Difference	-0.981	(0.527)		-2.014	0.053
Week 4	Control	30.174	(0.433)	***	29.325	31.022
	Program	29.420	(0.393)	***	28.649	30.191
	Difference	-0.754	(0.501)		-1.735	0.227
Week 7	Control	36.113	(0.447)	***	35.237	36.988
	Program	35.714	(0.419)	***	34.893	36.535
	Difference	-0.398	(0.495)		-1.368	0.571
Week 10	Control	43.183	(0.517)	***	42.170	44.196
	Program	43.311	(0.496)	***	42.340	44.283
	Difference	0.128	(0.573)		-0.994	1.250
Week 13	Control	51.601	(0.684)	***	50.260	52.941
	Program	52.480	(0.659)	***	51.188	53.772
	Difference	0.880	(0.799)		-0.687	2.446
Week 16	Control	61.622	(0.972)	***	59.716	63.527
	Program	63.547	(0.937)	***	61.710	65.383
	Difference	1.925	(1.204)		-0.434	4.284

Table B.1.25. Estimated scores for first grade Black program participants and control students

First Grade (N=88)		Estimated Score	SE	Sig.	Confidence Interval	
Week 1	Control	23.327	(0.537)	***	22.275	24.379
	Program	22.083	(0.536)	***	21.032	23.133
	Difference	-1.245	(0.723)		-2.661	0.172
Week 4	Control	28.122	(0.531)	***	27.082	29.162
	Program	27.897	(0.551)	***	26.816	28.978
	Difference	-0.225	(0.712)		-1.620	1.171
Week 7	Control	33.861	(0.549)	***	32.784	34.938
	Program	35.176	(0.594)	***	34.011	36.341
	Difference	1.315	(0.734)		-0.124	2.754
Week 10	Control	40.732	(0.641)	***	39.476	41.987
	Program	44.289	(0.726)	***	42.866	45.711
	Difference	3.557	(0.874)	***	1.843	5.270
Week 13	Control	48.956	(0.856)	***	47.278	50.634
	Program	55.696	(1.021)	***	53.696	57.697
	Difference	6.740	(1.233)	***	4.324	9.156
Week 16	Control	58.802	(1.230)	***	56.392	61.212
	Program	69.978	(1.543)	***	66.954	73.002
	Difference	11.176	(1.874)	***	7.503	14.849

Table B.1.26. Estimated scores for first grade Asian program participants and control students

First Grade (N=108)		Estimated Score	SE	Sig.	Confidence Interval	
Week 1	Control	23.789	(0.504)	***	22.801	24.777
	Program	23.797	(0.442)	***	22.931	24.663
	Difference	0.008	(0.609)		-1.186	1.202
Week 4	Control	28.588	(0.502)	***	27.605	29.572
	Program	29.295	(0.458)	***	28.398	30.192
	Difference	0.707	(0.590)		-0.449	1.863
Week 7	Control	34.317	(0.521)	***	33.295	35.338
	Program	36.013	(0.498)	***	35.036	36.989
	Difference	1.696	(0.596)	**	0.527	2.865
Week 10	Control	41.154	(0.602)	***	39.973	42.334
	Program	44.219	(0.601)	***	43.042	45.397
	Difference	3.066	(0.697)	***	1.699	4.432
Week 13	Control	49.315	(0.791)	***	47.765	50.865
	Program	54.246	(0.809)	***	52.661	55.831
	Difference	4.931	(0.967)	***	3.036	6.827
Week 16	Control	59.055	(1.117)	***	56.865	61.245
	Program	66.495	(1.158)	***	64.226	68.764
	Difference	7.440	(1.446)	***	4.606	10.274

Table B.1.27. Estimated scores for third grade White program participants and control students

Third Grade (N=121)		Estimated Score	SE	Sig.	Confidence Interval	
Week 1	Control	58.086	(0.594)	***	56.921	59.251
	Program	55.477	(0.505)	***	54.486	56.467
	Difference	-2.609	(0.769)	***	-4.117	-1.101
Week 4	Control	62.750	(0.532)	***	61.707	63.793
	Program	60.877	(0.464)	***	59.967	61.787
	Difference	-1.873	(0.692)	**	-3.230	-0.517
Week 7	Control	67.783	(0.494)	***	66.815	68.751
	Program	66.794	(0.443)	***	65.925	67.662
	Difference	-0.989	(0.646)		-2.255	0.276
Week 10	Control	73.213	(0.507)	***	72.219	74.207
	Program	73.276	(0.466)	***	72.362	74.190
	Difference	0.063	(0.669)		-1.247	1.373
Week 13	Control	79.072	(0.595)	***	77.905	80.239
	Program	80.378	(0.554)	***	79.293	81.464
	Difference	1.307	(0.792)		-0.247	2.860
Week 16	Control	85.393	(0.759)	***	83.906	86.881
	Program	88.160	(0.710)	***	86.769	89.551
	Difference	2.767	(1.020)	**	0.768	4.766

Table B.1.28. Estimated scores for third grade Black program participants and control students

Third Grade (N=71)		Estimated Score	SE	Sig.	Confidence Interval	
Week 1	Control	55.136	(0.876)	***	53.418	56.853
	Program	52.123	(0.736)	***	50.680	53.566
	Difference	-3.013	(1.137)	**	-5.241	-0.784
Week 4	Control	59.619	(0.789)	***	58.072	61.166
	Program	57.339	(0.678)	***	56.011	58.667
	Difference	-2.280	(1.030)	*	-4.299	-0.261
Week 7	Control	64.461	(0.739)	***	63.013	65.909
	Program	63.067	(0.651)	***	61.791	64.344
	Difference	-1.394	(0.972)		-3.299	0.512
Week 10	Control	69.689	(0.766)	***	68.188	71.191
	Program	69.358	(0.694)	***	67.998	70.717
	Difference	-0.331	(1.019)		-2.329	1.666
Week 13	Control	75.335	(0.902)	***	73.566	77.104
	Program	76.266	(0.834)	***	74.631	77.901
	Difference	0.931	(1.214)		-1.450	3.311
Week 16	Control	81.432	(1.149)	***	79.180	83.684
	Program	83.853	(1.078)	***	81.740	85.966
	Difference	2.420	(1.562)		-0.641	5.482

Table B.1.29. Estimated scores for third grade Asian program participants and control students

Third Grade (N=81)		Estimated Score	SE	Sig.	Confidence Interval	
Week 1	Control	52.346	(0.585)	***	51.200	53.491
	Program	51.445	(0.570)	***	50.328	52.562
	Difference	-0.900	(0.793)		-2.455	0.654
Week 4	Control	57.072	(0.544)	***	56.007	58.138
	Program	56.351	(0.530)	***	55.312	57.391
	Difference	-0.721	(0.729)		-2.151	0.709
Week 7	Control	62.218	(0.531)	***	61.176	63.259
	Program	61.716	(0.517)	***	60.704	62.728
	Difference	-0.502	(0.704)		-1.882	0.878
Week 10	Control	67.819	(0.572)	***	66.698	68.940
	Program	67.583	(0.553)	***	66.498	68.667
	Difference	-0.236	(0.755)		-1.716	1.243
Week 13	Control	73.917	(0.683)	***	72.579	75.254
	Program	73.998	(0.660)	***	72.706	75.291
	Difference	0.082	(0.908)		-1.698	1.862
Week 16	Control	80.555	(0.864)	***	78.860	82.249
	Program	81.014	(0.839)	***	79.371	82.658
	Difference	0.459	(1.166)		-1.825	2.744

Table B.1.30. Model predicting race-moderated (non-White) Fall Kindergarten students' weekly assessments[a]

	Effect	SE(Effect)	Sig.
Fixed Effects			
Benchmark	0.634	(0.020)	***
Alternative treatment	0.443	(0.096)	***
Non-White	-0.096	(0.091)	
Program	-0.417	(0.098)	***
Time[b]	0.214	(0.016)	***
Program × time	0.164	(0.022)	***
Time squared	-0.004	(0.001)	***
Program × time squared	-0.007	(0.001)	***
Non-White × program	0.161	(0.118)	
Non-White × time	-0.048	(0.019)	*
Non-White × program × time	0.019	(0.026)	
Non-White × time squared	0.003	(0.001)	**
Non-White × program × time squared	-0.001	(0.001)	
Intercept	-0.031	(0.089)	
Observations			
Weeks	4474		
Students	359		
Pairs	193		
Schools	17		

Notes: a: outcome is natural log of assessment score + 1; b: weeks since 9-1-2012
* p <0.05
** p < 0.01
*** p < 0.001
Kindergarten sample includes 107 White and 252 non-White students

Table B.1.31. Model predicting race-moderated (non-White) Fall first grade students' weekly assessments[a]

	Effect	SE(Effect)	Sig.
Fixed Effects			
Benchmark	0.477	(0.011)	***
Alternative treatment	-0.059	(0.020)	**
Non-White	-0.075	(0.022)	***
Program	-0.039	(0.022)	
Time[b]	0.058	(0.001)	***
Program × time	0.005	(0.002)	*
Non-White × program	0.021	(0.029)	
Non-White × time	0.000	(0.002)	
Non-White × program × time	0.006	(0.003)	*
Intercept	1.712	(0.041)	***
Observations			
Weeks	5078		
Students	409		
Pairs	215		
Schools	21		

Notes: a: outcome is natural log of assessment score + 1; b: weeks since 9-1-2012
* p <0.05
** p < 0.01
*** p < 0.001
First grade sample includes 161 White and 248 non-White students

Table B.1.32. Model predicting race-moderated (non-White) Fall third grade students' weekly assessments[a]

	Effect	SE(Effect)	Sig.
Fixed Effects			
Benchmark	0.682	(0.017)	***
Alternative treatment	-0.042	(0.027)	
Non-White	-0.008	(0.027)	
Program	-0.041	(0.028)	
Time[b]	0.036	(0.001)	***
Program × time	0.008	(0.002)	***
Non-White × program	-0.004	(0.035)	
Non-White × time	-0.005	(0.002)	*
Non-White × program × time	-0.005	(0.003)	
Intercept	1.132	(0.064)	***
Observations			
Weeks	3617		
Students	305		
Pairs	167		
Schools	21		

Notes: a: outcome is natural log of assessment score + 1; b: weeks since 9-1-2012
* p <0.05
** p < 0.01
*** p < 0.001
Third grade sample includes 121 White and 184 non-White students

Table B.1.33. Estimated scores for Kindergarten White program participants and control students

Kindergarten (N=107)		Estimated Score	SE	Sig.	Confidence Interval	
Week 1	Control	2.144	(0.229)	***	1.695	2.593
	Program	1.382	(0.154)	***	1.080	1.683
	Difference	-0.762	(0.232)	**	-1.217	-0.308
Week 4	Control	4.602	(0.332)	***	3.951	5.253
	Program	5.225	(0.329)	***	4.581	5.870
	Difference	0.623	(0.337)		-0.038	1.285
Week 7	Control	8.201	(0.540)	***	7.142	9.260
	Program	12.210	(0.690)	***	10.858	13.563
	Difference	4.010	(0.635)	***	2.765	5.255
Week 10	Control	12.928	(0.822)	***	11.318	14.539
	Program	21.757	(1.196)	***	19.414	24.101
	Difference	8.829	(1.074)	***	6.724	10.934
Week 13	Control	18.435	(1.131)	***	16.219	20.651
	Program	30.826	(1.650)	***	27.592	34.059
	Difference	12.391	(1.463)	***	9.523	15.259
Week 16	Control	23.996	(1.646)	***	20.770	27.222
	Program	35.131	(2.085)	***	31.045	39.218
	Difference	11.135	(2.085)	***	7.050	15.221

Table B.1.34. Estimated scores for Kindergarten non-White program participants and control students

Kindergarten (N=252)		Estimated Score	SE	Sig.	Confidence Interval	
Week 1	Control	1.805	(0.161)	***	1.490	2.121
	Program	1.500	(0.146)	***	1.214	1.787
	Difference	-0.305	(0.148)	*	-0.594	-0.016
Week 4	Control	3.524	(0.228)	***	3.078	3.970
	Program	5.206	(0.320)	***	4.579	5.832
	Difference	1.682	(0.228)	***	1.236	2.128
Week 7	Control	6.111	(0.356)	***	5.413	6.808
	Program	12.030	(0.667)	***	10.723	13.338
	Difference	5.920	(0.484)	***	4.971	6.868
Week 10	Control	9.896	(0.547)	***	8.823	10.969
	Program	22.149	(1.188)	***	19.820	24.477
	Difference	12.252	(0.889)	***	10.509	13.996
Week 13	Control	15.276	(0.812)	***	13.686	16.867
	Program	33.793	(1.772)	***	30.319	37.266
	Difference	18.516	(1.317)	***	15.935	21.097
Week 16	Control	22.701	(1.270)	***	20.211	25.191
	Program	43.243	(2.424)	***	38.493	47.994
	Difference	20.542	(1.916)	***	16.787	24.297

Table B.1.35. Estimated scores for first grade White program participants and control students

First Grade (N=161)						
Week 1	Control	25.185	(0.439)	***	24.325	26.045
	Program	24.204	(0.387)	***	23.445	24.963
	Difference	-0.981	(0.527)		-2.014	0.053
Week 7	Control	36.113	(0.447)	***	35.237	36.988
	Program	35.714	(0.419)	***	34.893	36.535
	Difference	-0.398	(0.495)		-1.368	0.571
Week 10	Control	43.183	(0.517)	***	42.170	44.196
	Program	43.311	(0.496)	***	42.340	44.283
	Difference	0.128	(0.573)		-0.994	1.250
Week 13	Control	51.601	(0.684)	***	50.260	52.941
	Program	52.480	(0.659)	***	51.188	53.772
	Difference	0.880	(0.799)		-0.687	2.446
Week 16	Control	61.622	(0.972)	***	59.716	63.527
	Program	63.547	(0.937)	***	61.710	65.383
	Difference	1.925	(1.204)		-0.434	4.284

Table B.1.36. Estimated scores for first grade non-White program participants and control students

First Grade (N=248)		Estimated Score	SE	Sig.	Confidence Interval	
Week 1	Control	23.348	(0.332)	***	22.698	23.998
	Program	23.080	(0.331)	***	22.432	23.728
	Difference	-0.268	(0.414)		-1.080	0.544
Week 4	Control	27.956	(0.333)	***	27.303	28.609
	Program	28.601	(0.345)	***	27.924	29.278
	Difference	0.645	(0.401)		-0.141	1.432
Week 7	Control	33.435	(0.350)	***	32.749	34.121
	Program	35.387	(0.378)	***	34.646	36.128
	Difference	1.952	(0.406)	***	1.156	2.748
Week 10	Control	39.951	(0.406)	***	39.156	40.746
	Program	43.729	(0.457)	***	42.833	44.625
	Difference	3.778	(0.476)	***	2.844	4.712
Week 13	Control	47.701	(0.527)	***	46.668	48.733
	Program	53.984	(0.615)	***	52.778	55.189
	Difference	6.283	(0.665)	***	4.979	7.587
Week 16	Control	56.916	(0.733)	***	55.480	58.352
	Program	66.589	(0.882)	***	64.861	68.318
	Difference	9.673	(1.002)	***	7.709	11.637

Table B.1.37. Estimated scores for third grade White program participants and control students

Third Grade (N=121)		Estimated Score	SE	Sig.	Confidence Interval	
Week 1	Control	58.086	(0.594)	***	56.921	59.251
	Program	55.477	(0.505)	***	54.486	56.467
	Difference	-2.609	(0.769)	***	-4.117	-1.101
Week 4	Control	62.750	(0.532)	***	61.707	63.793
	Program	60.877	(0.464)	***	59.967	61.787
	Difference	-1.873	(0.692)	**	-3.230	-0.517
Week 7	Control	67.783	(0.494)	***	66.815	68.751
	Program	66.794	(0.443)	***	65.925	67.662
	Difference	-0.989	(0.646)		-2.255	0.276
Week 10	Control	73.213	(0.507)	***	72.219	74.207
	Program	73.276	(0.466)	***	72.362	74.190
	Difference	0.063	(0.669)		-1.247	1.373
Week 13	Control	79.072	(0.595)	***	77.905	80.239
	Program	80.378	(0.554)	***	79.293	81.464
	Difference	1.307	(0.792)		-0.247	2.860
Week 16	Control	85.393	(0.759)	***	83.906	86.881
	Program	88.160	(0.710)	***	86.769	89.551
	Difference	2.767	(1.020)	**	0.768	4.766

Table B.1.38. Estimated scores for third grade non-White program participants and control students

Third Grade (N=184)		Estimated Score	SE	Sig.	Confidence Interval	
Week 1	Control	53.434	(0.454)	***	52.544	54.324
	Program	51.863	(0.412)	***	51.055	52.671
	Difference	-1.571	(0.598)	**	-2.743	-0.399
Week 4	Control	58.021	(0.418)	***	57.203	58.840
	Program	56.854	(0.382)	***	56.105	57.603
	Difference	-1.167	(0.546)	*	-2.237	-0.097
Week 7	Control	62.995	(0.402)	***	62.207	63.783
	Program	62.316	(0.370)	***	61.591	63.041
	Difference	-0.679	(0.522)		-1.702	0.344
Week 10	Control	68.388	(0.427)	***	67.550	69.225
	Program	68.294	(0.395)	***	67.520	69.067
	Difference	-0.094	(0.554)		-1.181	0.992
Week 13	Control	74.235	(0.506)	***	73.243	75.228
	Program	74.836	(0.471)	***	73.913	75.758
	Difference	0.600	(0.664)		-0.701	1.902
Week 16	Control	80.575	(0.641)	***	79.320	81.831
	Program	81.995	(0.601)	***	80.818	83.172
	Difference	1.420	(0.853)		-0.252	3.092

Table B.1.39. Model predicting Dual Language Learner -moderated Fall Kindergarten student weekly assessments[a]

	Effect	SE(Effect)	Sig.
Fixed Effects			
Benchmark	0.642	(0.020)	***
Alternative treatment	0.431	(0.096)	***
Dual Language Learner	-0.214	(0.085)	*
Program	-0.286	(0.065)	***
Time[b]	0.179	(0.010)	***
Program × time	0.155	(0.014)	***
Time squared	-0.003	(0.001)	***
Program × time squared	-0.007	(0.001)	***
Dual Language Learner × program	-0.063	(0.117)	
Dual Language Learner × time	0.004	(0.018)	
Dual Language Learner × program × time	0.084	(0.026)	**
Dual Language Learner × time squared	0.001	(0.001)	
Dual Language Learner × program × time squared	-0.004	(0.001)	*
Intercept	-0.027	(0.067)	
Observations			
Weeks	4474		
Students	359		
Pairs	193		
Schools	17		

Notes: a: outcome is natural log of assessment score + 1; b: weeks since 9-1-2012
* p <0.05
** p < 0.01
*** p < 0.001
Kindergarten sample includes 264 non-Dual Language Learners and 95 Dual Language Learners

Table B.1.40. Model predicting Dual Language Learner -moderated Fall first grade students' weekly assessments[a]

	Effect	SE(Effect)	Sig.
Fixed Effects			
Benchmark	0.480	(0.011)	***
Alternative treatment	-0.058	(0.020)	**
Dual Language Learner	-0.040	(0.022)	
Program	-0.037	(0.018)	*
Time[b]	0.058	(0.001)	***
Program × time	0.007	(0.002)	***
Dual Language Learner × program	0.035	(0.030)	
Dual Language Learner × time	0.000	(0.002)	
Dual Language Learner × program × time	0.003	(0.003)	
Intercept	1.669	(0.039)	***
Observations			
Weeks	5078		
Students	409		
Pairs	215		
Schools	21		

Notes: a: outcome is natural log of assessment score + 1; b: weeks since 9-1-2012
* p <0.05
** p < 0.01
*** p < 0.001
First grade sample includes 263 non-Dual Language Learners and 146 Dual Language Learners

Table B.1.41. Model predicting Dual Language Learner-moderated Fall third grade students' weekly assessments[a]

	Effect	SE(Effect)	Sig.
Fixed Effects			
Benchmark	0.689	(0.016)	***
Alternative treatment	-0.054	(0.026)	*
Dual Language Learner	-0.097	(0.027)	***
Program	-0.076	(0.022)	***
Time[b]	0.033	(0.001)	***
Program × time	0.010	(0.002)	***
Dual Language Learner × program	0.084	(0.036)	*
Dual Language Learner × time	0.000	(0.002)	
Dual Language Learner × program × time	-0.013	(0.003)	***
Intercept	1.140	(0.058)	***
Observations			
Weeks	3214		
Students	268		
Pairs	156		
Schools	20		

Notes: a: outcome is natural log of assessment score + 1; b: weeks since 9-1-2012
* p <0.05
** p < 0.01
*** p < 0.001
Third grade sample includes 213 non-Dual Language Learners and 95 Dual Language Learners

Table B.1.42. Estimated scores for Kindergarten Non-Dual Language Learner program participants and control students

Kindergarten (N=264)		Estimated Score	SE	Sig.	Confidence Interval	
Week 1	Control	2.176	(0.176)	***	1.832	2.520
	Program	1.675	(0.143)	***	1.395	1.955
	Difference	-0.501	(0.162)	**	-0.818	-0.184
Week 4	Control	4.215	(0.249)	***	3.726	4.704
	Program	5.325	(0.294)	***	4.748	5.902
	Difference	1.109	(0.227)	***	0.665	1.554
Week 7	Control	7.154	(0.388)	***	6.394	7.914
	Program	11.626	(0.583)	***	10.483	12.768
	Difference	4.472	(0.431)	***	3.628	5.316
Week 10	Control	11.140	(0.579)	***	10.004	12.275
	Program	20.282	(0.985)	***	18.351	22.213
	Difference	9.142	(0.736)	***	7.700	10.584
Week 13	Control	16.209	(0.815)	***	14.613	17.806
	Program	29.290	(1.390)	***	26.565	32.015
	Difference	13.081	(1.026)	***	11.070	15.091
Week 16	Control	22.229	(1.196)	***	19.886	24.573
	Program	35.401	(1.798)	***	31.877	38.926
	Difference	13.172	(1.469)	***	10.292	16.052

Table B.1.43. Estimated scores for Kindergarten Dual Language Learner program participants and control students

Kindergarten (N=95)		Estimated Score	SE	Sig.	Confidence Interval	
Week 1	Control	1.577	(0.185)	***	1.214	1.939
	Program	1.209	(0.163)	***	0.889	1.528
	Difference	-0.368	(0.198)		-0.757	0.020
Week 4	Control	3.361	(0.257)	***	2.857	3.864
	Program	5.562	(0.404)	***	4.770	6.353
	Difference	2.201	(0.347)	***	1.521	2.880
Week 7	Control	6.192	(0.420)	***	5.369	7.015
	Program	14.806	(0.968)	***	12.909	16.702
	Difference	8.614	(0.825)	***	6.997	10.230
Week 10	Control	10.561	(0.679)	***	9.231	11.891
	Program	29.870	(1.900)	***	26.145	33.595
	Difference	19.309	(1.648)	***	16.079	22.539
Week 13	Control	17.112	(1.049)	***	15.056	19.169
	Program	47.884	(2.978)	***	42.048	53.720
	Difference	30.772	(2.570)	***	25.734	35.809
Week 16	Control	26.656	(1.787)	***	23.154	30.158
	Program	61.763	(4.292)	***	53.350	70.176
	Difference	35.107	(3.877)	***	27.508	42.706

Table B.1.44. Estimated scores for first grade Non-Dual Language Learner program participants and control students

First Grade (N=263)		Estimated Score	SE	Sig.	Confidence Interval	
Week 1	Control	24.457	(0.334)	***	23.803	25.111
	Program	23.606	(0.319)	***	22.981	24.232
	Difference	-0.851	(0.418)	*	-1.671	-0.032
Week 4	Control	29.292	(0.331)	***	28.643	29.941
	Program	28.903	(0.326)	***	28.265	29.542
	Difference	-0.389	(0.401)		-1.175	0.397
Week 7	Control	35.045	(0.344)	***	34.371	35.719
	Program	35.341	(0.349)	***	34.657	36.025
	Difference	0.296	(0.401)		-0.491	1.083
Week 10	Control	41.890	(0.399)	***	41.109	42.672
	Program	43.164	(0.415)	***	42.350	43.979
	Difference	1.274	(0.467)	**	0.359	2.189
Week 13	Control	50.036	(0.524)	***	49.008	51.064
	Program	52.672	(0.557)	***	51.580	53.764
	Difference	2.636	(0.650)	***	1.363	3.909
Week 16	Control	59.728	(0.740)	***	58.278	61.179
	Program	64.227	(0.798)	***	62.662	65.792
	Difference	4.498	(0.975)	***	2.588	6.409

Table B.1.45. Estimated scores for first grade Dual Language Learner program participants and control students

First Grade (N=146)		Estimated Score	SE	Sig.	Confidence Interval	
Week 1	Control	23.459	(0.424)	***	22.629	24.289
	Program	23.572	(0.399)	***	22.791	24.354
	Difference	0.113	(0.533)		-0.932	1.158
Week 4	Control	28.093	(0.420)	***	27.271	28.916
	Program	29.136	(0.413)	***	28.327	29.946
	Difference	1.043	(0.518)	*	0.028	2.058
Week 7	Control	33.605	(0.435)	***	32.754	34.457
	Program	35.961	(0.449)	***	35.080	36.841
	Difference	2.355	(0.526)	***	1.324	3.386
Week 10	Control	40.162	(0.502)	***	39.178	41.146
	Program	44.330	(0.542)	***	43.267	45.392
	Difference	4.168	(0.616)	***	2.960	5.376
Week 13	Control	47.961	(0.659)	***	46.669	49.252
	Program	54.594	(0.733)	***	53.158	56.031
	Difference	6.634	(0.854)	***	4.960	8.308
Week 16	Control	57.237	(0.930)	***	55.414	59.059
	Program	67.183	(1.056)	***	65.113	69.253
	Difference	9.946	(1.276)	***	7.445	12.447

Table B.1.46. Estimated scores for third grade Non-Dual Language Learner program participants and control students

Third Grade (N=213)		Estimated Score	SE	Sig.	Confidence Interval	
Week 1	Control	56.994	(0.485)	***	56.043	57.945
	Program	54.164	(0.403)	***	53.375	54.953
	Difference	-2.830	(0.605)	***	-4.015	-1.644
Week 4	Control	61.555	(0.441)	***	60.692	62.419
	Program	59.524	(0.376)	***	58.788	60.261
	Difference	-2.031	(0.546)	***	-3.100	-0.961
Week 7	Control	66.475	(0.416)	***	65.661	67.290
	Program	65.405	(0.366)	***	64.689	66.122
	Difference	-1.070	(0.511)	*	-2.072	-0.068
Week 10	Control	71.782	(0.430)	***	70.939	72.626
	Program	71.857	(0.389)	***	71.095	72.620
	Difference	0.075	(0.532)		-0.967	1.118
Week 13	Control	77.507	(0.501)	***	76.524	78.489
	Program	78.937	(0.461)	***	78.034	79.840
	Difference	1.430	(0.632)	*	0.192	2.668
Week 16	Control	83.681	(0.630)	***	82.447	84.915
	Program	86.704	(0.584)	***	85.559	87.848
	Difference	3.022	(0.813)	***	1.429	4.616

Table B.1.47. Estimated scores for third grade Dual Language Learner program participants and control students

Third Grade (N=95)		Estimated Score	SE	Sig.	Confidence Interval	
Week 1	Control	52.763	(0.579)	***	51.628	53.897
	Program	51.671	(0.578)	***	50.538	52.804
	Difference	-1.092	(0.769)		-2.599	0.416
Week 4	Control	57.421	(0.544)	***	56.355	58.487
	Program	56.458	(0.544)	***	55.392	57.524
	Difference	-0.963	(0.707)		-2.348	0.423
Week 7	Control	62.482	(0.536)	***	61.432	63.533
	Program	61.680	(0.534)	***	60.633	62.727
	Difference	-0.802	(0.681)		-2.137	0.533
Week 10	Control	67.983	(0.576)	***	66.853	69.112
	Program	67.377	(0.570)	***	66.260	68.494
	Difference	-0.606	(0.727)		-2.030	0.819
Week 13	Control	73.959	(0.679)	***	72.628	75.291
	Program	73.591	(0.668)	***	72.282	74.900
	Difference	-0.368	(0.869)		-2.071	1.334
Week 16	Control	80.454	(0.848)	***	78.792	82.115
	Program	80.370	(0.833)	***	78.739	82.002
	Difference	-0.083	(1.109)		-2.257	2.090

Table B.1.48. Model predicting FRPL-moderated Fall Kindergarten grade students' weekly assessments[a]

	Effect	SE(Effect)	Sig.
Fixed Effects			
Benchmark	0.629	(0.020)	***
Alternative treatment	0.385	(0.095)	***
FRPL	-0.034	(0.109)	
Program	-0.264	(0.117)	*
Time[b]	0.233	(0.021)	***
Program × time	0.152	(0.026)	***
Time squared	-0.004	(0.001)	***
Program × time squared	-0.008	(0.001)	***
FRPL × program	-0.076	(0.133)	
FRPL × time	-0.065	(0.023)	**
FRPL × program × time	0.030	(0.029)	
FRPL × time squared	0.003	(0.001)	*
FRPL × program × time squared	0.000	(0.002)	
Intercept	-0.079	(0.110)	
Observations			
Weeks	4410		
Students	354		
Pairs	192		
Schools	17		

Notes: a: outcome is natural log of assessment score + 1; b: weeks since 9-1-2012
* p <0.05
** p < 0.01
*** p < 0.001
Kindergarten sample includes 85 non-FRPL and 269 FRPL students

Table B.1.49. Model predicting FRPL-moderated Fall first grade students' weekly assessments[a]

	Effect	SE(Effect)	Sig.
Fixed Effects			
Benchmark	0.476	(0.011)	***
Alternative treatment	-0.065	(0.020)	**
FRPL	-0.100	(0.024)	***
Program	-0.083	(0.027)	**
Time[b]	0.057	(0.002)	***
Program × time	0.006	(0.002)	**
FRPL × program	0.080	(0.032)	*
FRPL × time	0.002	(0.002)	
FRPL × program × time	0.003	(0.003)	
Intercept	1.739	(0.042)	***
Observations			
Weeks	5000		
Students	403		
Pairs	214		
Schools	21		

Notes: a: outcome is natural log of assessment score + 1; b: weeks since 9-1-2012
* p <0.05
** p < 0.01
*** p < 0.001
First grade sample includes 112 non-FRPL and 291 FRPL students

Table B.1.50. Model predicting FRPL-moderated Fall third grade students' weekly assessments[a]

	Effect	SE(Effect)	Sig.
Fixed Effects			
Benchmark	0.690	(0.017)	***
Alternative treatment	-0.057	(0.026)	*
FRPL	-0.008	(0.028)	
Program	-0.055	(0.032)	
Time[b]	0.031	(0.002)	***
Program × time	0.009	(0.002)	***
FRPL × program	0.011	(0.038)	
FRPL × time	0.003	(0.002)	
FRPL × program × time	-0.005	(0.003)	
Intercept	1.116	(0.065)	***
Observations			
Weeks	3556		
Students	301		
Pairs	167		
Schools	21		

Notes: a: outcome is natural log of assessment score + 1; b: weeks since 9-1-2012
* p <0.05
** p < 0.01
*** p < 0.001
Third grade sample includes 87 non-FRPL and 217 FRPL students

Table B.1.51. Estimated scores for Kindergarten FRPL program participants and control students

Kindergarten (N=269)		Estimated Score	SE	Sig.	Confidence Interval	
Week 1	Control	1.779	(0.152)	***	1.481	2.077
	Program	1.305	(0.133)	***	1.045	1.566
	Difference	-0.474	(0.136)	***	-0.741	-0.206
Week 4	Control	3.484	(0.217)	***	3.059	3.909
	Program	4.740	(0.290)	***	4.171	5.308
	Difference	1.256	(0.205)	***	0.853	1.659
Week 7	Control	6.002	(0.337)	***	5.341	6.664
	Program	11.123	(0.608)	***	9.931	12.315
	Difference	5.120	(0.436)	***	4.266	5.975
Week 10	Control	9.585	(0.512)	***	8.582	10.588
	Program	20.717	(1.092)	***	18.577	22.858
	Difference	11.132	(0.812)	***	9.540	12.724
Week 13	Control	14.489	(0.744)	***	13.032	15.947
	Program	32.000	(1.647)	***	28.773	35.228
	Difference	17.511	(1.223)	***	15.113	19.909
Week 16	Control	20.939	(1.130)	***	18.724	23.154
	Program	41.535	(2.282)	***	37.062	46.008
	Difference	20.596	(1.805)	***	17.058	24.134

Table B.1.52. Estimated scores for Kindergarten non-FRPL program participants and control students

Kindergarten (N=85)		Estimated Score	SE	Sig.	Confidence Interval	
Week 1	Control	2.059	(0.280)	***	1.509	2.609
	Program	1.656	(0.179)	***	1.306	2.006
	Difference	-0.403	(0.291)		-0.973	0.167
Week 4	Control	4.763	(0.401)	***	3.976	5.550
	Program	6.019	(0.389)	***	5.256	6.782
	Difference	1.256	(0.429)	**	0.415	2.097
Week 7	Control	9.028	(0.680)	***	7.695	10.361
	Program	13.900	(0.820)	***	12.293	15.508
	Difference	4.872	(0.814)	***	3.277	6.467
Week 10	Control	15.117	(1.100)	***	12.962	17.273
	Program	24.412	(1.406)	***	21.657	27.168
	Difference	9.295	(1.375)	***	6.600	11.989
Week 13	Control	22.926	(1.601)	***	19.788	26.065
	Program	33.818	(1.901)	***	30.093	37.543
	Difference	10.892	(1.881)	***	7.205	14.580
Week 16	Control	31.805	(2.538)	***	26.830	36.781
	Program	37.326	(2.343)	***	32.733	41.919
	Difference	5.520	(2.819)		-0.005	11.046

Table B.1.53. Estimated scores for first grade FRPL program participants and control students

First Grade (N=291)		Estimated Score	SE	Sig.	Confidence Interval	
Week 1	Control	23.376	(0.306)	***	22.776	23.976
	Program	23.466	(0.306)	***	22.865	24.066
	Difference	0.090	(0.387)		-0.669	0.849
Week 4	Control	28.042	(0.307)	***	27.439	28.644
	Program	28.969	(0.317)	***	28.347	29.591
	Difference	0.927	(0.375)	*	0.192	1.662
Week 7	Control	33.601	(0.323)	***	32.967	34.234
	Program	35.709	(0.345)	***	35.034	36.385
	Difference	2.109	(0.379)	***	1.365	2.852
Week 10	Control	40.224	(0.376)	***	39.486	40.961
	Program	43.966	(0.415)	***	43.152	44.780
	Difference	3.743	(0.445)	***	2.870	4.615
Week 13	Control	48.114	(0.492)	***	47.151	49.078
	Program	54.080	(0.559)	***	52.984	55.176
	Difference	5.966	(0.622)	***	4.747	7.184
Week 16	Control	57.516	(0.687)	***	56.168	58.863
	Program	66.469	(0.803)	***	64.894	68.044
	Difference	8.953	(0.935)	***	7.122	10.785

Table B.1.54. Estimated scores for first grade non-FRPL program participants and control students

First Grade (N=112)		Estimated Score	SE	Sig.	Confidence Interval	
Week 1	Control	25.884	(0.520)	***	24.865	26.904
	Program	23.822	(0.430)	***	22.979	24.665
	Difference	-2.062	(0.641)	**	-3.319	-0.805
Week 4	Control	30.870	(0.501)	***	29.888	31.853
	Program	28.974	(0.430)	***	28.132	29.817
	Difference	-1.896	(0.611)	**	-3.094	-0.697
Week 7	Control	36.781	(0.503)	***	35.795	37.767
	Program	35.196	(0.451)	***	34.312	36.080
	Difference	-1.585	(0.607)	**	-2.774	-0.396
Week 10	Control	43.788	(0.573)	***	42.664	44.911
	Program	42.709	(0.533)	***	41.666	43.753
	Difference	-1.078	(0.698)		-2.446	0.290
Week 13	Control	52.094	(0.765)	***	50.595	53.592
	Program	51.782	(0.719)	***	50.373	53.191
	Difference	-0.312	(0.961)		-2.195	1.572
Week 16	Control	61.940	(1.104)	***	59.777	64.104
	Program	62.738	(1.040)	***	60.699	64.777
	Difference	0.798	(1.431)		-2.007	3.602

Table B.1.55. Estimated scores for third grade FRPL program participants and control students

Third Grade (N=214)		Estimated Score	SE	Sig.	Confidence Interval	
Week 1	Control	54.797	(0.458)	***	53.899	55.695
	Program	52.848	(0.415)	***	52.035	53.662
	Difference	-1.949	(0.574)	***	-3.074	-0.823
Week 4	Control	59.425	(0.428)	***	58.586	60.264
	Program	58.003	(0.393)	***	57.232	58.774
	Difference	-1.422	(0.525)	**	-2.451	-0.393
Week 7	Control	64.437	(0.418)	***	63.618	65.256
	Program	63.652	(0.388)	***	62.890	64.413
	Difference	-0.785	(0.502)		-1.769	0.198
Week 10	Control	69.865	(0.443)	***	68.995	70.734
	Program	69.841	(0.416)	***	69.025	70.656
	Difference	-0.024	(0.531)		-1.066	1.018
Week 13	Control	75.742	(0.517)	***	74.729	76.756
	Program	76.622	(0.488)	***	75.666	77.579
	Difference	0.880	(0.634)		-0.363	2.123
Week 16	Control	82.108	(0.641)	***	80.852	83.364
	Program	84.053	(0.609)	***	82.859	85.247
	Difference	1.945	(0.812)	*	0.354	3.537

Table B.1.56. Estimated scores for third grade non-FRPL program participants and control students

Third Grade (N=87)		Estimated Score	SE	Sig.	Confidence Interval	
Week 1	Control	56.887	(0.703)	***	55.509	58.265
	Program	55.053	(0.601)	***	53.876	56.231
	Difference	-1.834	(0.893)	*	-3.585	-0.083
Week 4	Control	61.516	(0.636)	***	60.269	62.762
	Program	60.299	(0.560)	***	59.200	61.397
	Difference	-1.217	(0.807)		-2.798	0.364
Week 7	Control	66.514	(0.597)	***	65.345	67.684
	Program	66.035	(0.544)	***	64.970	67.101
	Difference	-0.479	(0.755)		-1.960	1.001
Week 10	Control	71.913	(0.616)	***	70.706	73.120
	Program	72.308	(0.574)	***	71.183	73.434
	Difference	0.395	(0.783)		-1.139	1.930
Week 13	Control	77.743	(0.719)	***	76.335	79.152
	Program	79.169	(0.673)	***	77.851	80.487
	Difference	1.426	(0.924)		-0.386	3.237
Week 16	Control	84.040	(0.907)	***	82.261	85.818
	Program	86.671	(0.845)	***	85.015	88.327
	Difference	2.632	(1.183)	*	0.312	4.951

Table B.1.57. Model predicting benchmark-moderated Fall Kindergarten grade students' weekly assessments[a]

	Effect	SE(Effect)	Sig.
Fixed Effects			
Alternative treatment	0.475	(0.096)	***
Ability group 2	1.199	(0.093)	***
Ability group 3	1.941	(0.100)	***
Program	-0.371	(0.092)	***
Time[b]	0.182	(0.015)	***
Program × time	0.263	(0.020)	***
Time squared	-0.002	(0.001)	*
Program × time squared	-0.011	(0.001)	***
Program × ability group 2	0.194	(0.126)	
Program × ability group 3	0.032	(0.134)	
Ability group 2 × time	-0.013	(0.020)	
Ability group 3 × time	0.012	(0.021)	
Ability group 2 × program × time	-0.111	(0.027)	***
Ability group 3 × program × time	-0.155	(0.029)	***
Ability group 2 × time squared	0.000	(0.001)	
Ability group 3 × time squared	-0.003	(0.001)	*
Ability group 2 × program × time squared	0.004	(0.001)	*
Ability group 3 × program × time squared	0.006	(0.002)	***
Intercept	-0.365	(0.078)	***
Observations			
Weeks	4474		
Students	359		
Pairs	193		
Schools	17		

Notes: a: outcome is natural log of assessment score + 1; b: weeks since 9-1-2012
* p <0.05
** p < 0.01
*** p < 0.001
Kindergarten sample includes 116 Low, 134 Middle, and 109 High Benchmark students

Table B.1.58. Model predicting benchmark-moderated Fall first grade students' weekly assessments[a]

	Effect	SE(Effect)	Sig.
Fixed Effects			
Alternative treatment	-0.040	(0.022)	
Ability group 2	0.471	(0.026)	***
Ability group 3	0.607	(0.028)	***
Program	-0.021	(0.024)	
Time[b]	0.070	(0.001)	***
Time squared	0.017	(0.002)	***
Program × ability group 2	-0.029	(0.033)	
Program × ability group 2	0.007	(0.034)	
Ability group 2 × time	-0.015	(0.002)	***
Ability group 3 × time	-0.021	(0.002)	***
Ability group 2 × program × time	-0.012	(0.003)	***
Ability group 3 × program × time	-0.014	(0.003)	***
Intercept	2.796	(0.021)	***
Observations			
Weeks	5078		
Students	409		
Pairs	215		
Schools	21		

Notes: a: outcome is natural log of assessment score + 1; b: weeks since 9-1-2012
* p <0.05
** p < 0.01
*** p < 0.001
First grade sample includes 129 Low, 154 Middle, and 126 High Benchmark students

Table B.1.59. Model predicting benchmark-moderated Fall third grade students' weekly assessments[a]

	Effect	SE(Effect)	Sig.
Fixed Effects			
Alternative treatment	-0.087	(0.019)	***
Ability group 2	0.411	(0.021)	***
Ability group 3	0.540	(0.022)	***
Program	-0.049	(0.019)	**
Time[b]	0.033	(0.001)	***
Time squared	0.007	(0.001)	***
Program × ability group 2	-0.038	(0.024)	
Program × ability group 2	0.011	(0.025)	
Ability group 2 × time	-0.007	(0.001)	***
Ability group 3 × time	-0.014	(0.001)	***
Ability group 2 × program × time	-0.003	(0.002)	
Ability group 3 × program × time	-0.002	(0.002)	
Intercept	3.679	(0.018)	***
Observations			
Weeks	3631		
Students	308		
Pairs	168		
Schools	21		

Notes: a: outcome is natural log of assessment score + 1; b: weeks since 9-1-2012
* p <0.05
** p < 0.01
*** p < 0.001
Third grade sample includes 89 Low, 113 Middle, and 106 High Benchmark students

Table B.1.60. Estimated scores for Kindergarten Low Benchmark program participants and control students

Kindergarten (N=116)		Estimated Score	SE	Sig.	Confidence Interval	
Week 1	Control	-0.131	(0.060)	*	-0.249	-0.013
	Program	-0.261	(0.050)	***	-0.359	-0.164
	Difference	-0.130	(0.063)	*	-0.254	-0.006
Week 4	Control	0.467	(0.083)	***	0.304	0.630
	Program	1.336	(0.132)	***	1.078	1.595
	Difference	0.870	(0.114)	***	0.646	1.094
Week 7	Control	1.407	(0.135)	***	1.143	1.671
	Program	4.935	(0.333)	***	4.283	5.587
	Difference	3.528	(0.286)	***	2.967	4.089
Week 10	Control	2.841	(0.216)	***	2.418	3.265
	Program	11.107	(0.681)	***	9.771	12.443
	Difference	8.266	(0.599)	***	7.092	9.439
Week 13	Control	4.962	(0.331)	***	4.313	5.611
	Program	18.832	(1.105)	***	16.665	20.998
	Difference	13.870	(0.972)	***	11.965	15.774
Week 16	Control	7.997	(0.559)	***	6.903	9.092
	Program	25.085	(1.625)	***	21.901	28.269
	Difference	17.088	(1.478)	***	14.191	19.984

Table B.1.61. Estimated scores for Kindergarten Middle Benchmark program participants and control students

Kindergarten (N=134)		Estimated Score	SE	Sig.	Confidence Interval	
Week 1	Control	1.846	(0.181)	***	1.491	2.202
	Program	1.637	(0.166)	***	1.312	1.962
	Difference	-0.210	(0.201)		-0.604	0.185
Week 4	Control	3.631	(0.244)	***	3.153	4.109
	Program	5.082	(0.318)	***	4.460	5.705
	Difference	1.451	(0.294)	***	0.875	2.028
Week 7	Control	6.341	(0.383)	***	5.591	7.092
	Program	11.058	(0.624)	***	9.835	12.282
	Difference	4.717	(0.552)	***	3.636	5.798
Week 10	Control	10.338	(0.593)	***	9.176	11.501
	Program	19.544	(1.067)	***	17.452	21.635
	Difference	9.205	(0.938)	***	7.366	11.045
Week 13	Control	16.061	(0.883)	***	14.331	17.791
	Program	29.080	(1.544)	***	26.053	32.106
	Difference	13.018	(1.349)	***	10.374	15.662
Week 16	Control	24.012	(1.460)	***	21.151	26.873
	Program	36.849	(2.177)	***	32.583	41.115
	Difference	12.837	(2.095)	***	8.731	16.942

Table B.1.62. Estimated scores for Kindergarten High Benchmark program participants and control students

Kindergarten (N=109)		Estimated Score	SE	Sig.	Confidence Interval	
Week 1	Control	5.106	(0.430)	***	4.264	5.949
	Program	3.619	(0.314)	***	3.004	4.234
	Difference	-1.487	(0.453)	**	-2.376	-0.599
Week 4	Control	9.250	(0.581)	***	8.111	10.388
	Program	8.963	(0.543)	***	7.899	10.027
	Difference	-0.287	(0.590)		-1.444	0.870
Week 7	Control	14.947	(0.896)	***	13.191	16.703
	Program	17.245	(0.977)	***	15.330	19.160
	Difference	2.298	(0.971)	*	0.394	4.202
Week 10	Control	21.997	(1.303)	***	19.443	24.550
	Program	27.368	(1.528)	***	24.372	30.364
	Difference	5.371	(1.485)	***	2.461	8.281
Week 13	Control	29.738	(1.717)	***	26.373	33.103
	Program	36.448	(1.988)	***	32.551	40.346
	Difference	6.711	(1.917)	***	2.954	10.468
Week 16	Control	37.081	(2.395)	***	32.386	41.775
	Program	40.972	(2.486)	***	36.100	45.845
	Difference	3.892	(2.730)		-1.458	9.242

Table B.1.63. Estimated scores for first grade Low Benchmark program participants and control students

First Grade (N=129)		Estimated Score	SE	Sig.	Confidence Interval	
Week 1	Control	16.490	(0.351)	***	15.802	17.178
	Program	16.498	(0.344)	***	15.824	17.172
	Difference	0.008	(0.395)		-0.766	0.781
Week 4	Control	20.553	(0.382)	***	19.804	21.302
	Program	21.720	(0.397)	***	20.941	22.498
	Difference	1.167	(0.408)	**	0.366	1.967
Week 7	Control	25.560	(0.433)	***	24.710	26.409
	Program	28.500	(0.479)	***	27.562	29.438
	Difference	2.940	(0.444)	***	2.069	3.811
Week 10	Control	31.730	(0.525)	***	30.700	32.759
	Program	37.303	(0.616)	***	36.096	38.510
	Difference	5.574	(0.552)	***	4.492	6.655
Week 13	Control	39.333	(0.686)	***	37.989	40.677
	Program	48.734	(0.849)	***	47.069	50.398
	Difference	9.401	(0.794)	***	7.845	10.957
Week 16	Control	48.702	(0.944)	***	46.853	50.551
	Program	63.576	(1.230)	***	61.165	65.986
	Difference	14.874	(1.227)	***	12.469	17.278

Table B.1.64. Estimated scores for first grade Middle Benchmark program participants and control students

First Grade (N=154)		Estimated Score	SE	Sig.	Confidence Interval	
Week 1	Control	26.596	(0.497)	***	25.622	27.570
	Program	25.488	(0.462)	***	24.582	26.394
	Difference	-1.108	(0.548)	*	-2.182	-0.033
Week 4	Control	31.487	(0.514)	***	30.479	32.494
	Program	30.680	(0.490)	***	29.720	31.641
	Difference	-0.806	(0.528)		-1.842	0.230
Week 7	Control	37.244	(0.554)	***	36.157	38.330
	Program	36.890	(0.541)	***	35.829	37.952
	Difference	-0.353	(0.533)		-1.397	0.691
Week 10	Control	44.021	(0.642)	***	42.763	45.278
	Program	44.318	(0.640)	***	43.063	45.572
	Difference	0.297	(0.614)		-0.906	1.500
Week 13	Control	51.999	(0.803)	***	50.424	53.574
	Program	53.201	(0.814)	***	51.606	54.795
	Difference	1.202	(0.825)		-0.416	2.820
Week 16	Control	61.391	(1.062)	***	59.309	63.473
	Program	63.825	(1.087)	***	61.694	65.956
	Difference	2.434	(1.196)	*	0.090	4.778

Table B.1.65. Estimated scores for first grade High Benchmark program participants and control students

First Grade (N=126)		Estimated Score	SE	Sig.	Confidence Interval	
Week 1	Control	30.446	(0.605)	***	29.259	31.632
	Program	30.251	(0.588)	***	29.099	31.402
	Difference	-0.195	(0.700)		-1.568	1.178
Week 4	Control	35.417	(0.606)	***	34.229	36.606
	Program	35.584	(0.601)	***	34.405	36.763
	Difference	0.167	(0.656)		-1.120	1.453
Week 7	Control	41.175	(0.634)	***	39.932	42.418
	Program	41.828	(0.643)	***	40.568	43.087
	Difference	0.653	(0.642)		-0.605	1.910
Week 10	Control	47.843	(0.720)	***	46.431	49.255
	Program	49.137	(0.741)	***	47.685	50.588
	Difference	1.294	(0.722)		-0.122	2.709
Week 13	Control	55.565	(0.897)	***	53.808	57.323
	Program	57.693	(0.927)	***	55.877	59.510
	Difference	2.128	(0.962)	*	0.243	4.013
Week 16	Control	64.509	(1.185)	***	62.186	66.831
	Program	67.710	(1.227)	***	65.306	70.115
	Difference	3.202	(1.382)	*	0.493	5.910

Table B.1.66. Estimated scores for third grade Low Benchmark program participants and control students

Third Grade (N=89)		Estimated Score	SE	Sig.	Confidence Interval	
Week 1	Control	39.525	(0.691)	***	38.170	40.879
	Program	38.208	(0.657)	***	36.921	39.495
	Difference	-1.317	(0.706)		-2.701	0.068
Week 4	Control	43.724	(0.709)	***	42.335	45.113
	Program	43.131	(0.689)	***	41.781	44.481
	Difference	-0.593	(0.684)		-1.934	0.747
Week 7	Control	48.359	(0.747)	***	46.894	49.824
	Program	48.672	(0.742)	***	47.218	50.126
	Difference	0.313	(0.691)		-1.042	1.667
Week 10	Control	53.474	(0.818)	***	51.870	55.077
	Program	54.908	(0.828)	***	53.286	56.530
	Difference	1.434	(0.756)		-0.047	2.915
Week 13	Control	59.119	(0.931)	***	57.294	60.944
	Program	61.928	(0.958)	***	60.050	63.806
	Difference	2.809	(0.902)	**	1.041	4.576
Week 16	Control	65.349	(1.095)	***	63.203	67.496
	Program	69.829	(1.145)	***	67.585	72.072
	Difference	4.480	(1.142)	***	2.242	6.717

Table B.1.67. Estimated scores for third grade Middle Benchmark program participants and control students

Third Grade (N=113)		Estimated Score	SE	Sig.	Confidence Interval	
Week 1	Control	59.702	(0.836)	***	58.065	61.340
	Program	55.363	(0.761)	***	53.871	56.855
	Difference	-4.339	(0.831)	***	-5.968	-2.711
Week 4	Control	64.677	(0.837)	***	63.036	66.318
	Program	60.649	(0.775)	***	59.130	62.169
	Difference	-4.028	(0.779)	***	-5.554	-2.501
Week 7	Control	70.059	(0.863)	***	68.368	71.750
	Program	66.431	(0.811)	***	64.843	68.020
	Difference	-3.628	(0.760)	***	-5.118	-2.138
Week 10	Control	75.883	(0.923)	***	74.074	77.692
	Program	72.756	(0.877)	***	71.036	74.475
	Difference	-3.127	(0.804)	***	-4.703	-1.551
Week 13	Control	82.183	(1.027)	***	80.169	84.197
	Program	79.673	(0.985)	***	77.742	81.604
	Difference	-2.510	(0.934)	**	-4.341	-0.680
Week 16	Control	89.000	(1.183)	***	86.681	91.319
	Program	87.239	(1.142)	***	85.000	89.477
	Difference	-1.761	(1.156)		-4.027	0.505

Table B.1.68. Estimated scores for third grade High Benchmark program participants and control students

Third Grade (N=106)		Estimated Score	SE	Sig.	Confidence Interval	
Week 1	Control	67.621	(1.070)	***	65.525	69.718
	Program	66.043	(0.941)	***	64.199	67.888
	Difference	-1.578	(1.074)		-3.683	0.528
Week 4	Control	71.712	(1.039)	***	69.676	73.749
	Program	71.080	(0.943)	***	69.232	72.928
	Difference	-0.633	(0.985)		-2.563	1.298
Week 7	Control	76.047	(1.041)	***	74.007	78.088
	Program	76.495	(0.969)	***	74.595	78.395
	Difference	0.447	(0.941)		-1.396	2.291
Week 10	Control	80.641	(1.090)	***	78.505	82.777
	Program	82.316	(1.031)	***	80.295	84.337
	Difference	1.675	(0.976)		-0.237	3.588
Week 13	Control	85.508	(1.196)	***	83.165	87.852
	Program	88.575	(1.137)	***	86.346	90.805
	Difference	3.067	(1.114)	**	0.883	5.251
Week 16	Control	90.666	(1.363)	***	87.994	93.338
	Program	95.304	(1.294)	***	92.768	97.841
	Difference	4.638	(1.357)	***	1.978	7.299

Appendix B.2: Findings from Robustness Analysis

The evaluation team also tested the variability of the program effect at the assigned pair level. To do this, we estimated a simpler model with a linear trajectory and a random effect for the impact of program participation on trajectory, *z*.

$$\ln\left[y_{wijk}+1\right]=\pi_{0ijk}+\pi_{1ijk}w+\rho r_{wijk}$$

$$where$$

$$\pi_{0ijk}=\beta_{00jk}+\beta_{01jk}\ln\left[b_{ijk}+1\right]+\beta_{02jk}a_{ijk}+\beta_{03jk}p_{ijk}+e_{ijk}+u_{jk}+v_{k}$$

$$and$$

$$\pi_{1ijk}=\beta_{10}+\beta_{11jk}p_{ijk}$$

$$and$$

$$\beta_{11jk}=\lambda_{110}+z_{jk}$$

where, λ_{110} is the average of the pair-specific differences in the trajectory based on program participation and *z* is the difference between the pair-specific difference in the trajectory and the average.

After the model was estimated, we then predicted the random effect. This allowed us to estimate a pair-specific effect. We then estimated the mean and confidence interval of this effect. If the confidence interval did not include 0, we found support for program effects. We also calculated the proportion of effects that were positive as a measure of robustness.

Table B.2.1 showcases the results of this analysis. As expected, we found average positive effects on all simple trajectories (noted as average pair difference from model in the table). We also found non-zero variance of this effect at the pair level for all grades except third (noted as variance of difference in the table).

When we computed the pair specific effect from the model, we found the mean pair effects were consistent with the model estimated mean effect. These means were, on average, statistically different than zero.

Finally, looking at the proportion of pairs with an estimated positive effect, we find that 92 percent of kindergartener pairs, 97 percent of first graders, 79 percent of second graders, and 70 percent of third graders, showed a positive effect on a simple trajectory.

Table B.2.1. Results from Robustness Analysis

	Kindergarten (N=359)	First Grade (N=409)	Second Grade (N=265)	Third Grade (N=308)
Average estimated pair difference	0.0390	0.0083	0.0053	0.0040
SE	(0.0033)	(0.0013)	(0.0013)	(0.0008)
Lower bound 95% CI	*0.0324*	*0.0058*	*0.0027*	*0.0025*
Higher bound 95% CI	*0.0455*	*0.0108*	*0.0080*	*0.0056*
Variance of difference	0.0011	0.0001	0.0001	0.0001
SE	(0.0002)	(0.0000)	(0.0000)	(0.0000)
Lower bound 95% CI	*0.0008*	*0.0001*	*0.0001*	*0.0001*
Higher bound 95% CI	*0.0015*	*0.0002*	*0.0002*	*0.0001*
Average predicted pair difference	0.0359	0.0085	0.0055	0.0042
SE	(0.0015)	(0.0005)	(0.0005)	(0.0006)
Lower bound 95% CI	*0.0328*	*0.0075*	*0.0045*	*0.0030*
Higher bound 95% CI	*0.0389*	*0.0094*	*0.0065*	*0.0054*
Proportion predicted positive effect	0.9585	0.9349	0.8811	0.6964
SE	(0.0144)	(0.0169)	(0.0272)	(0.0356)
Lower bound 95% CI	*0.9188*	*0.8927*	*0.8162*	*0.6220*
Higher bound 95% CI	*0.9793*	*0.9612*	*0.9252*	*0.7618*

Notes: Standard errors in parentheses, confidence intervals in italics

Appendix C: IES What Works Clearinghouse Analysis

The What Works Clearinghouse (WWC), an initiative of the Institute of Education Sciences at the U.S. Department of Education, is the leading resource in the field of education that independently identifies and evaluates scientific evidence of effectiveness of educational practices, programs and policies.[2] Given the size of the MRC program within the state of Minnesota and the growing interest in replicating the MRC model in other states, we anticipate WWC interest in reviewing the results of the MRC K-3 impact evaluation. As such, we present here an analysis of the MRC K-3 impact evaluation data that adheres to WWC review criteria.

For the WWC analysis, the evaluation team conducted four separate grade-specific regression analyses comparing program and control group students' literacy outcomes as measured by their Winter benchmark scores. In addition, using Analysis of Covariance (ANCOVA) models, we tested the effect of treatment on Winter benchmark scores that included the Fall benchmark score as a covariate. The results of the WWC analysis confirm the statistically significant and positive impact of the MRC program on Kindergarten and first grade students' literacy skills. No statistically significant impact was found for second and third grade students. Below, we outline details of the WWC analysis.

Outcomes

As described in Section II.D, the evaluation used outcome data collected by the MRC program using the AIMSweb assessment system.[3] Three specific literacy skills that are appropriate for particular grade levels were assessed using AIMSweb: 1) letter sound fluency (Kindergarten), 2) nonsense word fluency (first grade), and 3) oral reading fluency (i.e., R-CBM; second and third grades). The AIMSweb assessments, published by Pearson, have been shown to have good measurement properties in terms of retest reliability for R-CBM, >.90 and letter sound fluency >.82; and alternate form reliability for nonsense word fluency >.74.[4] Depending on the criterion referenced test and time of administration, criterion validity ranged from .58 to .72 for letter sound fluency in kindergarten, .43 to .72 for nonsense word fluency in first grade, and .60 to .81 for R-CBM in 2nd and 3rd grade.[5] Since the outcome metrics varied by grade level, our analysis is presented as a separate study for each grade.

[2] http://ies.ed.gov/ncee/wwc/default.aspx

[3] http://www.aimsweb.com/

[4] http://www.aimsweb.com/resources/research-articles-and-information

[5] See the *AIMSweb Technical Manual* (2012) for a detailed report on each outcome measure's reliability and validity.

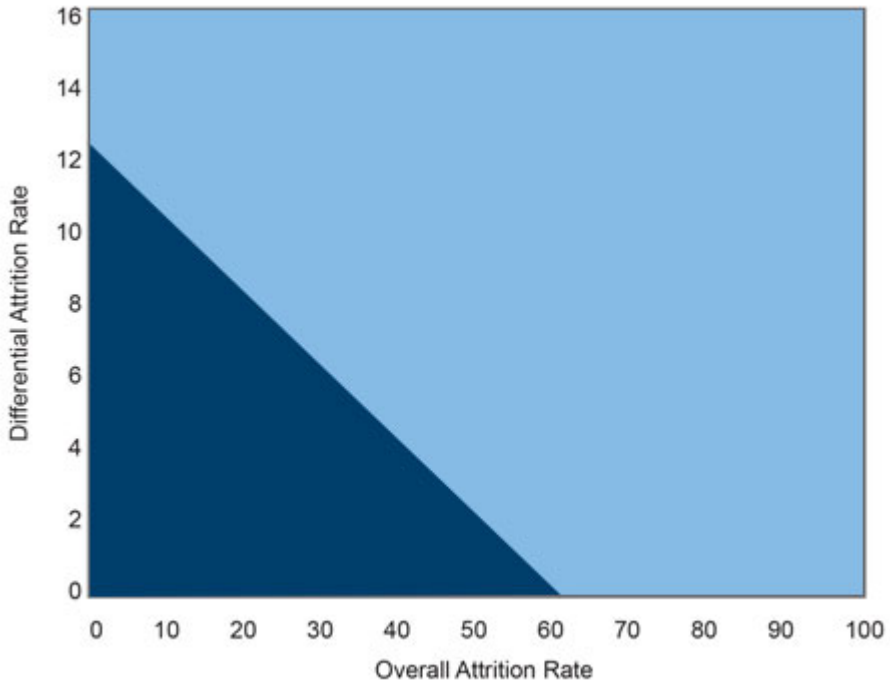
Randomization

The evaluation implemented a randomized controlled trial, experimental design where randomization to the program and control conditions occurred at the level of the student. Because students were randomized, it is not necessary to demonstrate equivalence between the program and control groups a priori. Likewise, student level randomization eliminates the need to consider the effects of school clustering on uncertainty.

Attrition

For each grade K-3, we demonstrate low levels of attrition assuming the "liberal" standards outlined in the *WWC Evidence Review Protocol for Early Childhood interventions (Version 2)*.[6] The liberal standards are appropriate because in early childhood interventions the mechanism of attrition is unlikely due to program assignment. Any combination of overall attrition and differential attrition in the lower, left corner (dark gray zone) of Figure C.1 below is considered low attrition.

Figure C.1: Acceptable Levels of Overall Attrition by Differential Attrition



In total, the evaluation team randomized 1,530 students to either the program or control conditions based on fall assessment scores.[7] Table C.1 below shows the number of students in each condition by grade.

[6] http://ies.ed.gov/ncee/wwc/pdf/reference_resources/ece_protocol_v2.0.pdf

[7] See section III.D for a detailed description of the randomization process

Table C.1. Number of Students Assigned to and Retained in Each Condition by Grade

Grade	Assigned Program (Retained/Analytic N)	Assigned Control (Retained/Analytic N)	Total (Retained/Analytic N)
Kindergarten	207 (144)	194 (150)	401 (294)
First Grade	228 (197)	222 (183)	450 (380)
Second Grade	170 (140)	148 (114)	318 (254)
Third Grade	196 (169)	165 (142)	361 (311)
Total	801 (650)	729 (589)	1,530 (1,239)

A number of students (291) were not available for Winter benchmark testing. This attrition poses a risk to the experimental results if the overall rate is too high or the difference in the rate between program and control groups is too large. Overall attrition was calculated as:

$$Overall = X = \frac{\text{Randomized Sample}}{\text{Analytic Sample}} \times 100$$

The differential attrition is the absolute value of the difference in the attrition rates between those assigned to the program group and those assigned to the control group. Differential attrition was calculated as:

$$Differential = Y = \left| \frac{\text{Randomized Sample (Program)}}{\text{Analytic Sample (Program)}} - \frac{\text{Randomized Sample (Control)}}{\text{Analytic Sample (Control)}} \right| \times 100$$

Table C.2 below lists the overall attrition rate (the X axis in Figure C.1 above) and the differential attrition rate (the Y axis in Figure C.1 above) by grade.

Table C.2. Overall and Differential Attrition Rates by Grade

Grade	Overall Attrition (X Axis)	Attrition for Program Group (A_p)	Attrition for Control Group (A_c)	Differential Attrition (Absolute Value; Y Axis)
Kindergarten	27	30	23	7
First Grade	16	14	18	4
Second Grade	20	18	23	5
Third Grade	14	14	14	0
Total	19	19	19	0

When plotting the combination of overall and differential attrition on the WWC attrition guide, illustrated in Figure C.1 above, we find acceptably low attrition levels for each grade (i.e., levels of overall attrition by differential attrition rates are in the green area of the figure).

Effect

Table C.3 below presents the results in effect-size units (Hedges' g) and the original assessment metric of four separate grade specific analyses comparing program and control group students' literacy outcomes measure by their Winter benchmark scores. The table also provides the results of Analysis of Covariance (ANCOVA) models testing the effect of treatment with a regression that also included the Fall benchmark score as a covariate.

Table C.3. Effect of MRC on Student Literacy Outcomes by Grade

	Effect	Mean Difference	ANCOVA
Grade	Hedges' g	Original Metric	
Kindergarten	0.52***	10.11***	10.08***
First Grade	0.39***	6.85***	6.85***
Second Grade	-0.03	-0.54	1.81
Third Grade	-0.10	-2.09	0.96

*** $p < 0.001$

Table C.3 shows a substantial effect size for Kindergarten that is also highly significant; an average difference of approximately 10.1 letter sounds between program and control group students. A highly significant, substantial effect size was also found for first grade students; an average difference of 6.9 letters sounds within nonsense words between program and control group students. In the second and third grades, the evaluation team observed a slight negative mean difference, with an effect size that is less than meaningful (< 0.2) and not statistically significant. Of note, when we control for the Fall test score, the direction of the effect is reversed, but remains statistically not significant.

Appendix D: Full Year Models and Effects Tables

Table D.1. Estimated week-to-week effects of program for Kindergarten student

Week			Effect	SE(Effect)	Sig.	CI (95%)	
0	to	1	2.713	(0.161)	***	2.398	3.029
1	to	2	2.592	(0.158)	***	2.282	2.901
2	to	3	2.411	(0.150)	***	2.117	2.706
3	to	4	2.182	(0.138)	***	1.910	2.453
4	to	5	1.915	(0.125)	***	1.671	2.159
5	to	6	1.624	(0.111)	***	1.406	1.842
6	to	7	1.321	(0.100)	***	1.125	1.517
7	to	8	1.020	(0.093)	***	0.837	1.203
8	to	9	0.731	(0.091)	***	0.552	0.911
9	to	10	0.465	(0.093)	***	0.282	0.648
10	to	11	0.228	(0.097)	*	0.037	0.418
11	to	12	0.025	(0.101)		-0.174	0.224
12	to	13	-0.139	(0.104)		-0.343	0.066
13	to	14	-0.263	(0.106)	*	-0.470	-0.056
14	to	15	-0.347	(0.106)	**	-0.553	-0.140
15	to	16	-0.390	(0.104)	***	-0.594	-0.187
16	to	17	-0.396	(0.102)	***	-0.595	-0.196
17	to	18	-0.363	(0.099)	***	-0.558	-0.169
18	to	19	-0.295	(0.098)	**	-0.488	-0.103
19	to	20	-0.192	(0.099)		-0.387	0.003
20	to	21	-0.055	(0.104)		-0.259	0.150
21	to	22	0.119	(0.114)		-0.105	0.344
22	to	23	0.332	(0.130)	*	0.076	0.587
23	to	24	0.587	(0.154)	***	0.286	0.888
24	to	25	0.891	(0.185)	***	0.528	1.255
25	to	26	1.255	(0.227)	***	0.810	1.700
26	to	27	1.692	(0.282)	***	1.139	2.245
27	to	28	2.221	(0.354)	***	1.527	2.915

* $p < 0.05$

** $p < 0.01$

*** $p < 0.001$

Kindergarten sample includes 368 students.

Table D.2. Model predicting Kindergarten student weekly assessments[a] as a function of cumulative weekly sessions

	Effect	SE(Effect)	Sig.
Fixed Effects			
Program	-0.014	(0.034)	
Spring	-0.237	(0.015)	***
Time[b]	0.184	(0.002)	***
Time Squared	-0.003	(0.000)	***
Number of sessions	0.065	(0.003)	***
Number of session squared	-0.002	(0.000)	***
Intercept	0.858	(0.048)	***
Observations			
Weeks	10399		
Students	368		
Schools	17		

Notes: a: outcome is natural log of assessment score + 1; b: weeks since 9-1-2012

* p <0.05

** p < 0.01

*** p < 0.001

Kindergarten sample includes 368 students.

Table D.3. Estimated week-to-week effects of program for first grade students

Week			Fall Metric					Spring Metric				
			Effect	SE(Effect)	Sig.	CI (95%)		Effect	SE(Effect)	Sig.	CI (95%)	
0	to	1	0.529	(0.058)	***	0.415	0.644	0.230	(0.022)	***	0.186	0.273
1	to	2	0.536	(0.060)	***	0.418	0.653	0.231	(0.022)	***	0.187	0.275
2	to	3	0.542	(0.061)	***	0.422	0.663	0.233	(0.023)	***	0.188	0.278
3	to	4	0.549	(0.063)	***	0.426	0.672	0.235	(0.023)	***	0.189	0.280
4	to	5	0.556	(0.064)	***	0.430	0.682	0.236	(0.023)	***	0.190	0.282
5	to	6	0.563	(0.066)	***	0.433	0.692	0.238	(0.024)	***	0.192	0.284
6	to	7	0.570	(0.068)	***	0.437	0.702	0.239	(0.024)	***	0.193	0.286
7	to	8	0.577	(0.069)	***	0.441	0.713	0.241	(0.024)	***	0.194	0.289
8	to	9	0.584	(0.071)	***	0.445	0.723	0.243	(0.025)	***	0.195	0.291
9	to	10	0.591	(0.073)	***	0.449	0.734	0.244	(0.025)	***	0.196	0.293
10	to	11	0.599	(0.074)	***	0.453	0.745	0.246	(0.025)	***	0.197	0.295
11	to	12	0.606	(0.076)	***	0.457	0.756	0.248	(0.026)	***	0.198	0.298
12	to	13	0.614	(0.078)	***	0.461	0.767	0.249	(0.026)	***	0.199	0.300
13	to	14	0.621	(0.080)	***	0.465	0.778	0.251	(0.026)	***	0.200	0.302
14	to	15	0.629	(0.082)	***	0.469	0.789	0.253	(0.027)	***	0.201	0.305
15	to	16	0.637	(0.084)	***	0.473	0.801	0.255	(0.027)	***	0.202	0.307

* $p < 0.05$

** $p < 0.01$

*** $p < 0.001$

First grade sample includes 393 students.

Table D.4. Model predicting first grade students' weekly assessments[a] as a function of cumulative weekly sessions

	Effect	SE(Effect)	Sig.	Effect	SE(Effect)	Sig.
Fixed Effects						
Program	-0.020	(0.015)		-0.014	(0.028)	
Time[b]	0.057	(0.001)	***	0.036	(0.000)	***
Number of sessions	0.012	(0.001)	***	0.007	(0.001)	***
Intercept	3.185	(0.016)	***	2.475	(0.035)	***
Observations[c]						
Weeks		6607			6607	
Students		393			393	
Schools		21				

Notes: a: outcome is natural log of assessment score + 1; b: weeks since 9-1-2012; c: Sample sizes for Fall first grade are those for Spring first grade.

* p <0.05

** p < 0.01

*** p < 0.001

First grade sample includes 393 students.

Table D.5. Estimated week-to-week effects of program for second grade students

Week			Effect	SE(Effect)	Sig.	CI (95%)	
0	to	1	0.252	(0.019)	***	0.214	0.290
1	to	2	0.253	(0.020)	***	0.214	0.291
2	to	3	0.254	(0.020)	***	0.215	0.293
3	to	4	0.255	(0.020)	***	0.216	0.294
4	to	5	0.256	(0.020)	***	0.217	0.296
5	to	6	0.257	(0.020)	***	0.218	0.297
6	to	7	0.259	(0.020)	***	0.219	0.299
7	to	8	0.260	(0.021)	***	0.219	0.300
8	to	9	0.261	(0.021)	***	0.220	0.302
9	to	10	0.262	(0.021)	***	0.221	0.304
10	to	11	0.264	(0.021)	***	0.222	0.305
11	to	12	0.265	(0.021)	***	0.223	0.307
12	to	13	0.266	(0.022)	***	0.224	0.308
13	to	14	0.267	(0.022)	***	0.224	0.310
14	to	15	0.268	(0.022)	***	0.225	0.312
15	to	16	0.270	(0.022)	***	0.226	0.313
16	to	17	0.271	(0.022)	***	0.227	0.315
17	to	18	0.272	(0.023)	***	0.228	0.317
18	to	19	0.274	(0.023)	***	0.229	0.318
19	to	20	0.275	(0.023)	***	0.230	0.320
20	to	21	0.276	(0.023)	***	0.231	0.322
21	to	22	0.277	(0.023)	***	0.231	0.323
22	to	23	0.279	(0.024)	***	0.232	0.325
23	to	24	0.280	(0.024)	***	0.233	0.327
24	to	25	0.281	(0.024)	***	0.234	0.328
25	to	26	0.283	(0.024)	***	0.235	0.330
26	to	27	0.284	(0.024)	***	0.236	0.332
27	to	28	0.285	(0.025)	***	0.237	0.334

* $p < 0.05$

** $p < 0.01$

*** $p < 0.001$

Second grade sample includes 267 students.

Table D.6. Model predicting second grade students' weekly assessments[a] as a function of cumulative weekly sessions

	Effect	SE(Effect)	Sig.
Fixed Effects			
Program	-0.039	(0.019)	*
Spring	0.005	(0.006)	
Time[b]	0.020	(0.000)	***
Number sessions	0.005	(0.000)	***
Intercept	3.558	(0.023)	***
Observations			
Weeks	7874		
Students	267		
Schools	20		

Notes: a: outcome is natural log of assessment score + 1; b: weeks since 9-1-2012

* p <0.05

** p < 0.01

*** p < 0.001

Second grade sample includes 267 students.

Table D.7. Estimated week-to-week effects of program for third grade students

Week			Effect	SE(Effect)	Sig.	CI (95%)	
0	to	1	0.198	(0.019)	***	0.160	0.236
1	to	2	0.199	(0.019)	***	0.160	0.237
2	to	3	0.199	(0.020)	***	0.161	0.237
3	to	4	0.200	(0.020)	***	0.161	0.238
4	to	5	0.200	(0.020)	***	0.161	0.239
5	to	6	0.201	(0.020)	***	0.162	0.239
6	to	7	0.201	(0.020)	***	0.162	0.240
7	to	8	0.202	(0.020)	***	0.162	0.241
8	to	9	0.202	(0.020)	***	0.162	0.242
9	to	10	0.202	(0.020)	***	0.163	0.242
10	to	11	0.203	(0.020)	***	0.163	0.243
11	to	12	0.203	(0.020)	***	0.163	0.244
12	to	13	0.204	(0.021)	***	0.164	0.244
13	to	14	0.204	(0.021)	***	0.164	0.245
14	to	15	0.205	(0.021)	***	0.164	0.246
15	to	16	0.205	(0.021)	***	0.165	0.246
16	to	17	0.206	(0.021)	***	0.165	0.247
17	to	18	0.206	(0.021)	***	0.165	0.248
18	to	19	0.207	(0.021)	***	0.166	0.248
19	to	20	0.208	(0.021)	***	0.166	0.249
20	to	21	0.208	(0.021)	***	0.166	0.250
21	to	22	0.209	(0.021)	***	0.166	0.251
22	to	23	0.209	(0.022)	***	0.167	0.251
23	to	24	0.210	(0.022)	***	0.167	0.252
24	to	25	0.210	(0.022)	***	0.167	0.253
25	to	26	0.211	(0.022)	***	0.168	0.253
26	to	27	0.211	(0.022)	***	0.168	0.254
27	to	28	0.212	(0.022)	***	0.168	0.255

* $p < 0.05$

** $p < 0.01$

*** $p < 0.001$

Third grade sample includes 310 students.

Table D.8. Model predicting third grade students' weekly assessments[a] as a function of cumulative weekly sessions

	Effect	SE(Effect)	Sig.
Fixed Effects			
Program	-0.022	(0.012)	
Spring	-0.034	(0.004)	***
Time[b]	0.013	(0.000)	***
Number sessions	0.002	(0.000)	***
Intercept	4.158	(0.014)	***
Program	-0.022	(0.012)	
Observations			
Weeks	8788		
Students	310		
Schools	21		

Notes: a: outcome is natural log of assessment score + 1; b: weeks since 9-1-2012

* p <0.05

** p < 0.01

*** p < 0.001

Third grade sample includes 310 students.

Table D.9. Multinomial logistic regression model predicting summary outcome of student participants

Predictor	Effect	SE(Effect)	Sig.
Lasting effect vs. no effect			
Number of session weeks	-0.035	(0.019)	
Assigned program	2.828	(0.345)	***
Assigned program ×			***
Number of session weeks	-0.073	(0.018)	***
Dual Language Learner	-0.327	(0.174)	
Black	-0.955	(0.315)	**
Asian	-0.549	(0.239)	*
Hispanic	-0.863	(0.387)	*
Other race	-0.598	(0.553)	
Female	0.061	(0.164)	
Intercept	-0.333	(0.317)	
Inconsistent effect vs. no effect			
Number of session weeks	-0.043	(0.022)	*
Assigned program	2.493	(0.370)	***
Assigned program ×			***
Number of session weeks	-0.053	(0.027)	*
Dual Language Learner	-0.010	(0.313)	
Black	-0.886	(0.266)	***
Asian	-0.539	(0.281)	
Hispanic	-0.758	(0.397)	
Other race	-1.133	(0.465)	*
Female	0.194	(0.161)	
Intercept	-0.802	(0.169)	***

Notes:

N = 1,348

pseudo-R-square = 0.10

* p <0.05

** p < 0.01

*** p < 0.001

Table D.10. Fixed effects regression model predicting students' weekly assessments (spline model)

	Kindergarten			Second Grade			Third Grade		
	Effect	SE(Effect)	Sig	Effect	SE(Effect)	Sig	Effect	SE(Effect)	Sig
Time	0.906	(0.033)	***	1.024	(0.050)	***	1.094	(0.063)	***
Time ×									
During program	0.257	(0.025)	***	0.069	(0.037)		-0.108	(0.048)	*
After program	0.445	(0.031)	***	0.057	(0.057)		-0.103	(0.063)	
Intercept	5.902	(0.323)	***	31.848	(0.443)	***	63.634	(0.472)	***
N Weeks	4,508			2,847			3,546		
N Students	264			198			226		
R2									
Within	0.635			0.414			0.328		
Between	0.471			0.235			0.405		
Overall	0.505			0.321			0.376		

Notes:

* p <0.05

** p < 0.01

*** p < 0.001

Appendix E: Glossary

AIMline: A student's projected growth trajectory, measured from the most recent benchmark period to the next (e.g., Fall to Winter or Winter to Spring).

AIMSWeb: AIMSWeb is the web-based assessment tool used for progress monitoring and data management of all Minnesota Reading Corps K-3 students. The AIMSWeb assessments evaluate four critical literacy skills that are appropriate for specific K-3 grade levels and seasons: 1) letter naming fluency (Kindergarten), 2) letter sound fluency (First Grade –Fall/Winter), 3) nonsense word fluency (First Grade – Winter/Spring), and 4) oral reading fluency (Second and Third Grades).

AmeriCorps: AmeriCorps is a national service program run by the Corporation for National and Community Service that engages members to serve at nonprofit organizations, public agencies and faith-based organizations nationwide. In exchange for their service, AmeriCorps members receive a modest living stipend and Education Award. Minnesota Reading Corps is the nation's largest state AmeriCorps program.

Benchmark: A standard score above which students are considered "on-track" for grade level achievement. MRC lists grade and season (I.e., Fall, Winter, Spring) appropriate benchmark scores for each general outcome measure (i.e., AIMSWeb & IGIDI). Students' scores on benchmark assessments determine their eligibility for Minnesota Reading Corps services and serve as baseline data to determine students' improvements as a result of the program.

"Big Five": At the PreK level, the MRC program focuses on integrating the "Big Five" Early Literacy Predictors into all aspects of the daily classroom routine. The "Big Five" for preschool students include conversational skills, vocabulary and background knowledge, book and print rules, phonological awareness (i.e., rhyming and alliteration), and alphabetic knowledge.

CNCS: The Corporation for National and Community Service (CNCS) is a federal agency that engages more than 4 million Americans in service through Senior Corps, AmeriCorps, and the Social Innovation Fund, and leads President Obama's national call to service initiative, United We Serve. CNCS is funding the primary federal funder of the Minnesota Reading Corps program, and is funding the current evaluation of the MRC.

Community Corps: Community Corps members are embedded in preschool classrooms and collaborate with the classroom's lead teacher to help develop children's early literacy skills to prepare for Kindergarten. Community Corps members are responsible for enhancing the literacy-rich environment within the classroom, conducting Tier 2 and 3 interventions and conducting/ tracking progress monitoring for students.

Community-based PreK: Community-based PreK programs are run through community-based organizations such as community centers.

DIBELS: Dynamic Indicators of Basic Early Literacy Skills (DIBELS) are a set of assessments used for universal screening and progress monitoring in grades K-6. DIBELS assessments help educators identify students who may need additional literacy instruction in order to become proficient readers. In the MRC program it is used by some schools as alternative assessment to AIMSWeb.

ELLCO: The Early Language & Literacy Classroom Observation (ELLCO) tool is used to assess five key elements of a classroom's literacy environment: classroom structure, curriculum, language environment, books and book reading, print and early writing. According to the ELLCO, a "Literacy Rich Classroom" is one that embeds literacy activities among daily routines.

Head Start: Head Start is a federal PreK program designed to promote school readiness for low-income pre-Kindergarten students by enhancing their cognitive, social and emotional development. Through Head Start programs, enrolled children and families can also receive health, nutrition and other social support programs depending on eligibility.

IGDI: The Individual Growth and Development Indicators (IGDI) is a set of standardized, individually administered assessments that are used to evaluate children's language and emergent literacy skills. IGDIs assess three key areas of emergent literacy: (1) Rhyming (Phonological Awareness); (2) Picture Naming (Vocabulary); and (3) Alliteration (Phonological Awareness).

Internal Coach: Individual rained by the Reading Corps to provide on-site literacy support and oversight to the MRC AmeriCorps member. Internal Coaches provide an on-site orientation for the MRC member, develop a daily schedule, assist in the implementation of literacy assessments, conduct integrity checks of the assessments and interventions, review student data and ensure the member is accurately reporting student data into AIMSWeb. The Internal Coach is a school employee, not a MRC member.

K-3: Kindergarten through third grade

K-Focus: A Kindergarten-Focused Literacy program in which members provide an additional 20 minutes of tutoring every day to small groups of students, typically focused on letter sound fluency. Kindergarten students who are served by K-Focus members receive a total of 40 minutes of tutoring every day.

Literacy rich schedule: Members in the PreK program work to implement and support a standard instructional regime/schedule that focuses on the "Big Five" emergent literacy skills (conversation skills, vocabulary and

background knowledge, book and print rules, phonological awareness-rhyming and alliteration, and alphabetic knowledge). Members assist the teaching team in implementing the literacy rich schedule and fostering a literacy rich classroom environment as defined by the Early Language and Literacy Classroom Observation (ELLCO), including name chart, theme-related books and props in five or more centers, sign-in area, writing center, word wall, etc.

Master Coach: Provides literacy coaching support to Internal Coaches and AmeriCorps members at multiple sites. The Master Coach schedules regular on-site visits to support and guide the site and its members it fulfilling the MRC program goals and ensures fidelity of implementation. The Master Coach provides training to members, conducts integrity checks, and reviews students' progress monitoring data. The Master Coach is an experienced literacy educator who serves as a consultant to MRC.

Member: A volunteer to who serves in the MRC AmeriCorps program. Member may refer to a volunteer in the K-3 program, or a PreK Professional Corps or Community Corps. Members deliver the one-on-one tutoring (PreK and K-3) and support implementation of the literacy rich schedule in MRC PreK classrooms. In recognition of their service, members receive a modest living stipend and Education Award.

MDE: Minnesota Department of Education.

MRC: The Minnesota Reading Corps (MRC) was started in 2003 to provide reading and literacy tutoring to children in PreK programs and students in Kindergarten through third-grade. The goal of the program is to ensure that students become successful readers and meet reading proficiency targets by the end of the third grade. MRC engages AmeriCorps members to provide literacy enrichment and tutoring services to PreK students. AmeriCorps members serve as one-on-one tutors and provide research-based interventions to both PreK and K-3 students who are just below proficiency in reading. As of the 2012-2013 school year, more than 1,100 AmeriCorps members implemented the program in 652 schools or sites and 184 school districts across the state of Minnesota.

OnCorps: A web-based database that stores information about students receiving MRC services. The database records student demographic information, assessment data, the amount of tutoring services students received, and other data such as: the number of books sent home, the number of times student's journals were completed, and family participation in MRC services

PreK: Preschool.

Professional Corps: Professional Corps members are current employees who are in a teaching position at the site. This member continues to fulfill their regular teaching responsibilities, but also incorporates specific MRC strategies in their instruction.

Program Coordinator: An employee of Minnesota Reading Corps, responsible for providing administrative oversight to the Minnesota Reading Corps program on a regional level, including member management, site management, and compliance with all AmeriCorps regulations. The Program Coordinator oversees regional recruitment efforts, works together with service sites in the interviewing, selection, and placement process for members.

Progress monitoring: A scientifically-based practice using weekly 1-minute reading tests to assess students' academic performance and evaluate the effectiveness of an intervention. Progress monitoring data helps teaching teams determine the effectiveness of interventions then make adjustments to instruction to ensure students reach their next benchmark target. For K-3, progress monitoring is conducted with all students receiving MRC tutoring each week by MRC members using 1-minute AIMSWeb tests. The scores are entered into AIMSWeb and used to create graphs that represent each student's progress relative to a specific intervention. For Pre-K, progress monitoring occurs monthly, for students receiving Tier 2 and 3 one-to-one intervention services.

RtI: Response to Intervention (RtI) is a practice of academic and behavior interventions designed to identify and provide early effective assistance to underperforming students. Research-based interventions are implemented and frequent progress monitoring is conducted to assess student response and progress. When students do not make progress, increasingly more intense interventions are introduced.

SEEDS: The SEEDS model is an interactive, skills-focused curriculum based on current research in early childhood education, child development, emergent literacy, and effective teaching. SEEDS is a relationship-based professional development program that provides a map to help adults *intentionally* demonstrate behaviors throughout their daily interactions with children that enrich academic growth and promote social/emotional well-being. SEEDS interaction include the following elements: Sensitivity – Look, listen, and ask questions to become aware of each child's needs, thoughts, abilities and feelings; Encouragement – Use intentional affirmations and positive non-verbal communication to create a shared positive learning environment; Education – Embed the "Big 5" literacy skills in daily routines (vocabulary, conversation, phonological awareness, book and print rules, and letter knowledge); Development of Skills Through Doing – Help children explore their world through hands-on learning; Self-Image Support– Balance the SEEDS quality interactions to support a child's feeling of being respected and capable.

ServeMinnesota: State Commission on AmeriCorps programs in Minnesota and responsible in Minnesota Law for Minnesota Reading Corps.

Service hours: The required hours of service AmeriCorps members must complete in order to fulfill their 11 months of service to AmeriCorps, and in return receive a living allowance and an education award to pay for college or pay back student loans. All full time members, K-3, Community Corps, and Professional Corps, must complete 1700 hours of service. Part time members must complete 920 hours. Service hours can be fulfilled not only through

members' time tutoring or working in the classroom, but also through participation in community and other school activities.

Summer Institute: A multi-day training program conducted over the summer to introduce new and old members, Internal Coaches, and Master Coaches to the Reading Corps program. The Institute consists of learning about the theories behind the program, the techniques used to implement the program, and the administrative components of the program. Education experts train Members and Coaches on all aspects of the program, and also provide time for practicing the techniques and the interventions. The Institute is also the time when most members will meet their Internal and Master Coaches for the first time.

Tier 1-3: Tier 1, 2, and 3 are the three "tiers" of a tiered instructional process lying at the core of the RtI model. Student scores on general outcome measure (e.g., AIMSWeb or IGDI) referenced to specific benchmarks determine a student's tier placement. The instruction that is then provided to students is based upon their respective tiers. Tier 1 students, approximately 75-80% of the population, are at the "Universal Level" and benefit from the standard whole class core literacy curriculum. They do not require supplemental instruction. Students who score in Tier 2 range, 15-20%, are those whose assessment scores are below the expected levels of achievement (benchmark) and are at risk for academic failure but are still above levels considered to indicate a high risk for failure. Tier 2 students typically are eligible for supplemental small group instruction. Students whose scores place them into Tier 3, approximately 5-10% of students, are considered to be at high risk for academic failure. They are typically offered one-to-one supplemental interventions and individualized educational plans.

*Tier 1 Instruction: In PreK programs, this is instruction that students receive in the general education classroom. It includes Reading Corps directed intentional teaching with embedded and explicit instruction. In K-3 programs, this is considered the core literacy instruction provided in the classrooms for all students.

*Tier 2 Instruction: (PreK program term) Provides additional, more intense instruction to children identified as needing extra help in targeted skill areas. Tier 2 instruction is in addition to Tier 1 instruction.

*Tier 3 Instruction: (PreK program term) Provides the most intense intervention approach for children identified as needing extra help in a targeted skill area. Tier 3 instruction builds onto Tier 2 instruction by providing more individualized and intense instruction.

Corporation for National and Community Service
1201 New York Avenue, NW
Washington, DC 20525

TEL: (202) 606-5000
TTY: (202) 606-3472

info@cns.gov

NationalService.gov